News about

B. F. Goodrich Chemical *raw materials*

These non-skid rubbers made by Tingley Rubber Corp., Rahway, N. J. B. F. Goodrich Chemical Co. supplies the Good-rite Resin 50 only.

NON-SKID RUBBERS GIVE WEARERS A BRAKE!

Good-rite Resin 50 improves abrasion resistance and wear

ONE look at these rubbers and you can see an important advantage—built-in rubber cleats that give safer traction on wet surfaces, ice or snow or other risky footing.

And there's another great advantage: the use of Good-rite Resin 50 in the rubber sole compound, to provide longer wear and improved surface abrasion resistance.

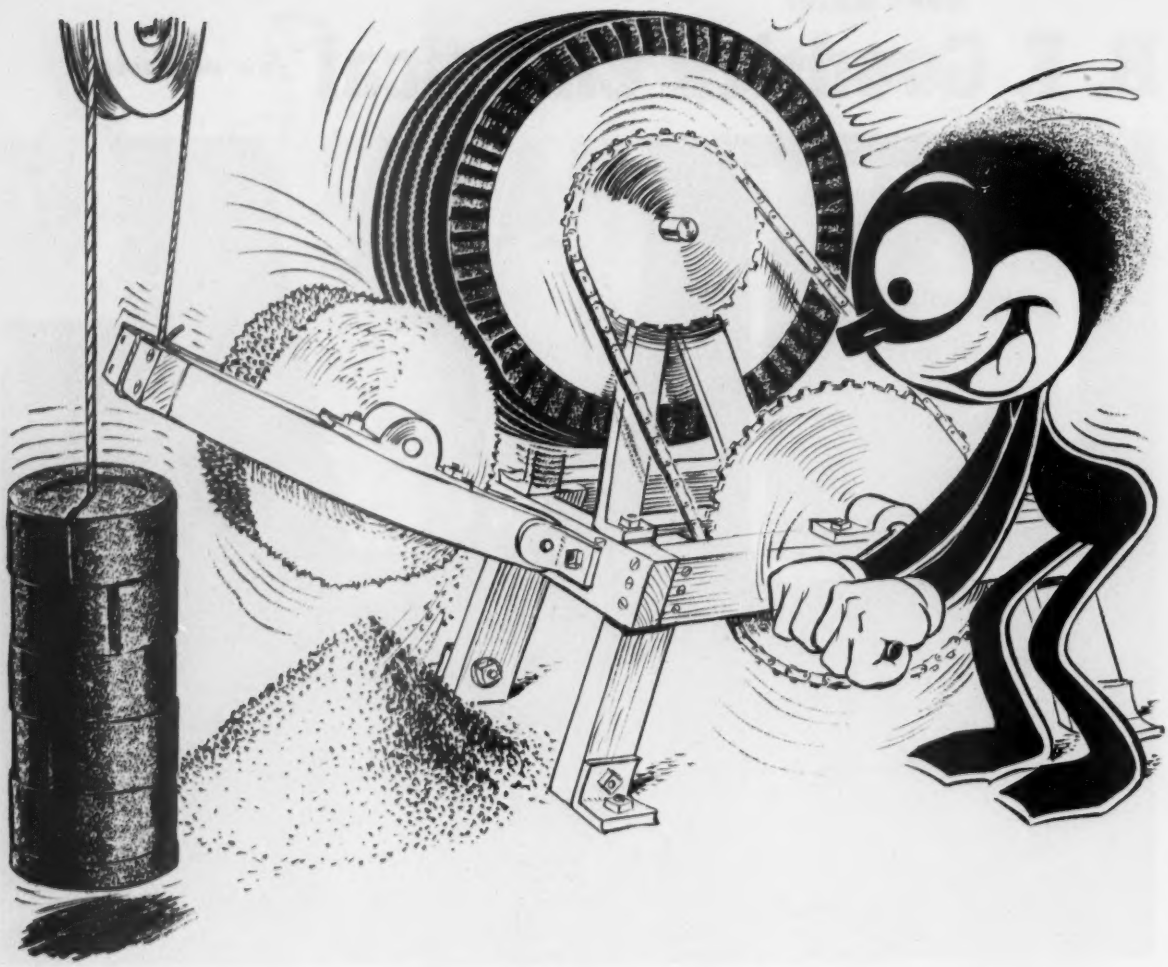
Soling compounds are just one of many products that are helped by Good-rite Resin 50. For this easy-processing, reinforcing and stiffening agent is compatible with crude rubber and most American rubbers. It affords a new and simple approach to hardness problems. It saves time by eliminating masterbatching. It gives rubber compounds better flex life, higher elongation, improved abrasion resistance and better handling because Resin 50 acts as a plasticizer at processing temperatures.

A white, free-flowing powder, Good-rite Resin 50 can be compounded in a wide range of colors. For helpful technical information, please write Dept. HB-3, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

B. F. Goodrich Chemical Company
A Division of The B. F. Goodrich Company

Hycar
Reg. U.S. Pat. Off.
American Rubber

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors



The toughest treads in history Are being made with **Philblack* E!**

SUPER Abrasion Resistance! Cold rubber tire treads, made with SAF Philblack E, rolled up the longest mileage records in the entire history of tires! 35% to 42% better than HAF black when tested in cold rubber passenger car tires under severe road conditions. 12% to 24% better in natural rubber truck tire treads, compared with EPC black. That's another record for Philblack E!

And Philblack E really stops cut and crack growth, too. So use this new wonder-working black whenever you need extra wear and service.

For full information, consult our technical sales representative who calls on you or write our nearest office.

PHILLIPS CHEMICAL COMPANY

PHILBLACK SALES DIVISION

EVANS BUILDING · AKRON 8, OHIO

PHILBLACK EXPORT SALES DIVISION · 80 BROADWAY · NEW YORK 5, N. Y.

* A Trademark

Philblack E, Philblack O and Philblack A are manufactured at Borger, Texas. Warehouses in Akron, Boston, Chicago and Trenton. West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.

MIXING CYCLE CUT 3 MINUTES WITH PLIOLITE S-6B

SUNSET Rubber Floor Tile and SUNSET Cove Base manufactured by the Burke Rubber Company, San Jose, California, was made easier and better with Pliolite S-6B.

• The manufacturer of this rubber floor tiling reports reducing his Banbury mixing schedule three full minutes since switching to Goodyear's use-proved PLIOLITE S-6B rubber reinforcing resin. In addition to easier production, he has gained these other outstanding advantages:

Improved hardness
Increased stiffness
Better abrasion resistance
Better product appearance

Outstanding for pigment dispersion and maintenance of its own color despite high processing temperatures, PLIOLITE S-6B makes possible excellent color development as well.

This ideal combination of characteristics makes PLIOLITE S-6B the preferred rubber reinforcing resin of the rubber industry. Write today for full details to:

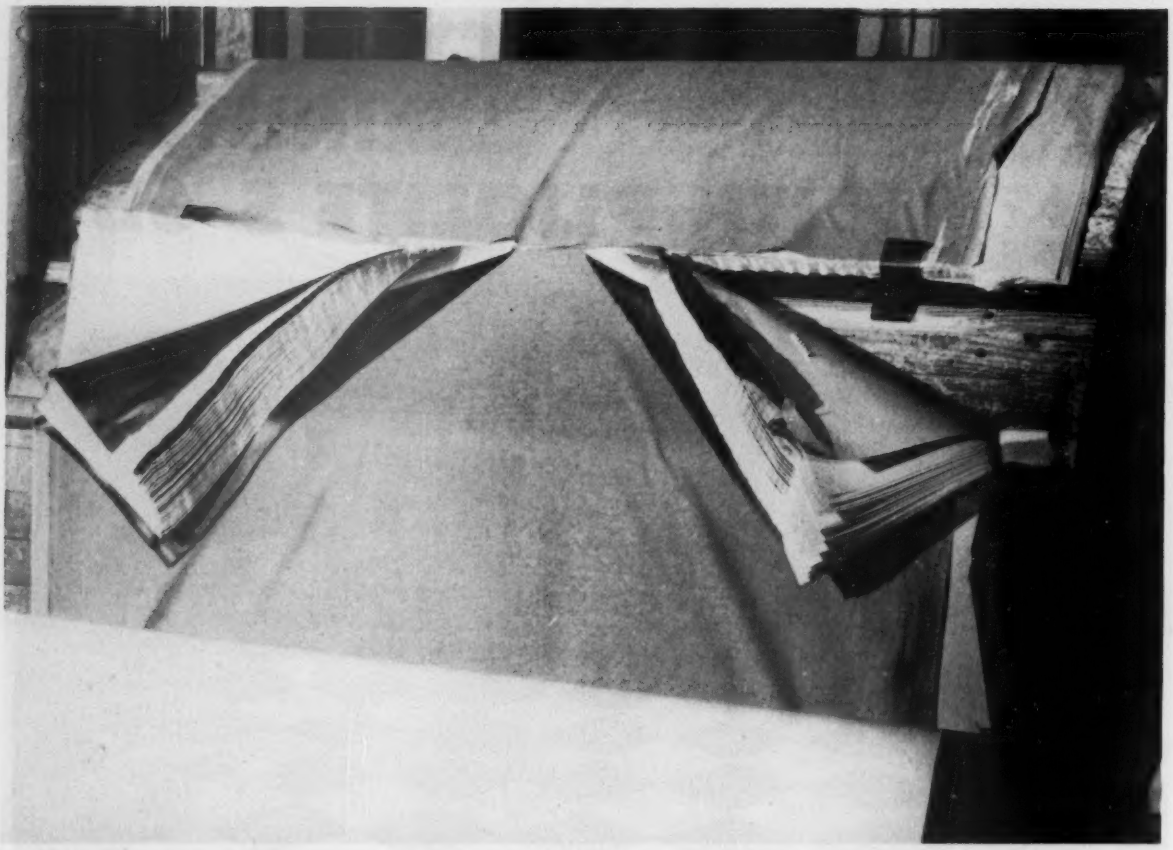
Goodyear, Chemical Division, Akron 16, Ohio

CHEMICAL
GOODYEAR
DIVISION

We think you'll like "THE GREATEST STORY EVER TOLD"— every Sunday—ABC Radio Network
THE GOODYEAR TELEVISION PLAYHOUSE— every other Sunday—NBC TV Network

Chemigum, Pliobond, Pliolite, Pliovic—
T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Use-Proved Products — CHEMIGUM • PLIOBOND • PLIOLITE • PLIOVIC • WING-CHEMICALS — The Finest Chemicals for Industry



LINERETTE PLIES UP PROFITS

Linerette separating paper plied up with frictioned stock before being cut in the clicking operation, saves time and money. Since 1925 Linerette, the specially processed separating paper, has been used with steadily increasing acceptance. It assures clean, fast separation without adhesion and contains no oil or wax. Here is how Linerette can help you:

- Preserves tack.
- Protects lightweight stock in shipment—no fabric needed.
- Keeps stock free of cloth marks or impressions.
- Clippings may be mixed with scrap and worked away when used in die-cutting operations.
- Where cleanliness is essential, Linerette is a low cost lining for trays and containers.
- Stocks can be calender-fed into it.
- Used with most types of lightweight stocks in sheets or strips.

Linerette is available in any width up to and including 54″ in rolls of 9″, 11½″, 13″ and 15″ diameters, on cores of 3″ i.d. The yield is approximately six square yards to the pound. A 9″ roll contains 375 linear yards and a 15″ diameter about 1150 linear yards. Ask for a sample today, just specify desired width.

THE CLEVELAND LINER & MFG. CO.
5508 Maurice Ave. • Cleveland 27, Ohio, U. S. A.
Cable Address: "BLUELINER"

GET THE FULL STORY ON CLIMCO PROCESSING

Illustrated booklet tells about Climco Liners and Linerette separating paper. Tells how to get better service from liners. Write for your copy now.

CLIMCO

LINERETTE

INTERLEAVING PAPER

MADE BY THE MANUFACTURERS OF *CLIMCO* PROCESSED LINERS

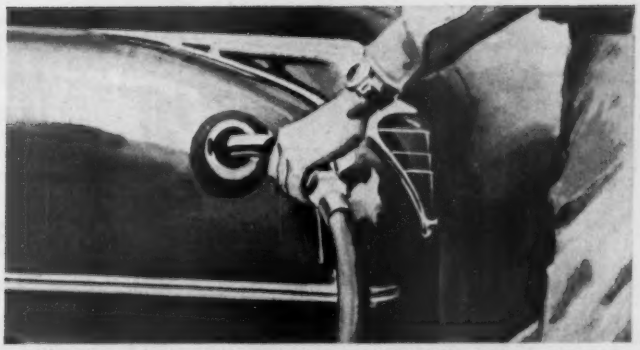
Look what they're doing with CHEMIGUM

• Wherever oil resistance and the excellent physical properties of quality rubber are needed, nitrile rubber and latex are called for. In textile inks, leather finishes, asphalt paving, chemical pipe, vinyl, rubber, paper, and many other products, CHEMIGUM —in solid or emulsion form—may improve properties or meet your plant processing needs. Write today for full details to: Goodyear, Chemical Division, Dept. G-6, Akron 16, Ohio.

Chemigum, Pliobond, Pliolite, Pliovic—
T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

CHEMICAL
GOODYEAR
DIVISION

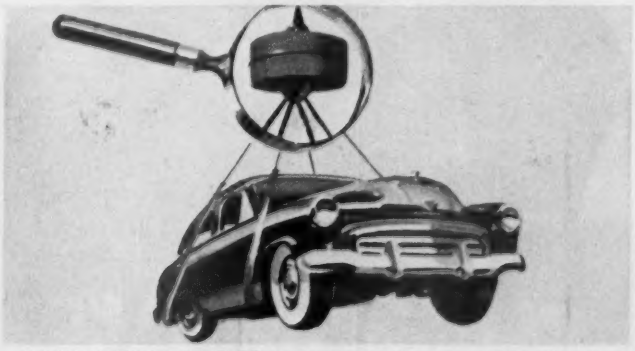
We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network
THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network



RESISTING PETROLEUM PRODUCTS — CHEMIGUM rubber maintains tolerances and good physical properties despite fuels, oils, solvents.

IMPROVING PAPERS — CHEMIGUM LATEX added in the beater, or by other means, as saturant or impregnant gives papers plastic-like properties like high edge tear — improves product.

BETTERING TEXTILES — Sizing, finishing, coating or laminating fibers with CHEMIGUM LATEX gives exceptional properties to woven and non-woven fabrics.



MAKING STRONG CEMENTS — Both solvent and water emulsion adhesives can be made sturdy enough to lift a car, using CHEMIGUM rubber or latex in their manufacture.

Use-Proved Products — CHEMIGUM • PLIOBOND • PLIOLITE • PLIOVIC • WING-CHEMICALS — The Finest Chemicals for Industry

Let's sit down ____ and talk things over

Here at Adamson we've been doing something that we believe is rather unique in the industry. Every now and then a manufacturer of rubber or plastics has expressed a desire to discuss certain problems pertaining to calendering or calendering equipment, and we have invited him and his associates to our conference room for a roundtable session with our staff. No one dreamed the idea up—it just grew. Some of the largest manufacturers in the industry have been our guests and have described the meetings as helpful and enlightening.

Certainly, since we build calenders and related equipment, these clinics have been of great value to us. And because we believe that a free exchange of opinions and ideas is the surest way to promote progress and improvement in any industry, we extend to you and your company a cordial invitation to our conference room. Perhaps, like the famous riddle of which came first, the chicken or the egg, many questions will have to be left unanswered, yet the benefits to be derived from a free discussion of our common problems cannot fail to be mutually helpful.

Why not 'phone or write us for a conference date? The obligation will be all ours.

ADAMSON UNITED COMPANY

BETTER MACHINES AND PROCESSES FOR BETTER RUBBER AND PLASTICS PRODUCTS

RUBBER FABRICATORS NEED ACCURATE CUTTING DIES

For Cutting

Rubber, Neoprene, Plastics, etc.
Sheeting, Foam, Sponge, Cellular,
Cured & Uncured

Gang Dies Our Specialty

- Accuracy to close Tolerances
- Durability
- Genuine Understanding of the problems of rubber goods manufacturers

MALLET HANDLE DIES

PURPOSE — For those who have no machinery and do not wish to purchase any. For Cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from bolts or not.

SERVICE—One to three days.

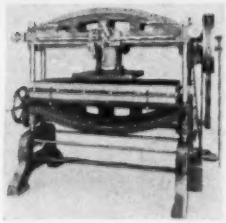
STEEL RULE CUTTING DIES

Used on Die Cutting Press, Printing Press or Power Press

PURPOSE — Especially suited for cutting — Rubber, Neoprene, Plastics, etc.

ADVANTAGE—Low in cost. Suitable for long production runs. It is necessary to cut from rectangular sheets which are fed into the press.

SERVICE—One day service.



STEEL RULE CLICKER DIES

Use On Clicker Machine or Dinker Press

PURPOSE—For Cutting Rubber, Neoprene, Plastics, etc.

ADVANTAGE — More reasonably priced than the all steel dies. Recommended for small and medium quantities where cost of an all steel die is not warranted.

SERVICE—One day service.

ALL STEEL DIES

Use On Clicker Machine or Beam Press or Power Press

PURPOSE—For Cutting—Rubber, Neoprene, Plastics, etc.

ADVANTAGE — Cut direct from rolls without first cutting into sheets.

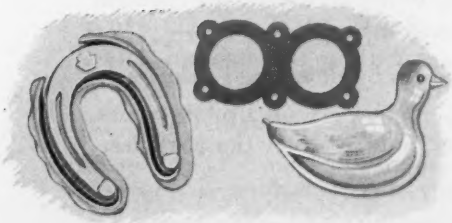
SERVICE—One to three day service on dies.

DIE CUTTING SERVICE

PURPOSE—For those who prefer to have their cutting done by others.

ADVANTAGE—We can die cut your product for you on our own presses rapidly and economically at a low "per thousand" cost.

SERVICE—One to three days.



Dies for cutting
Gaskets, flashing from molded parts, rubber soles, foam and sponge for furniture padding, inflated toys, clothing and footwear, etc.

SAME DAY SERVICE

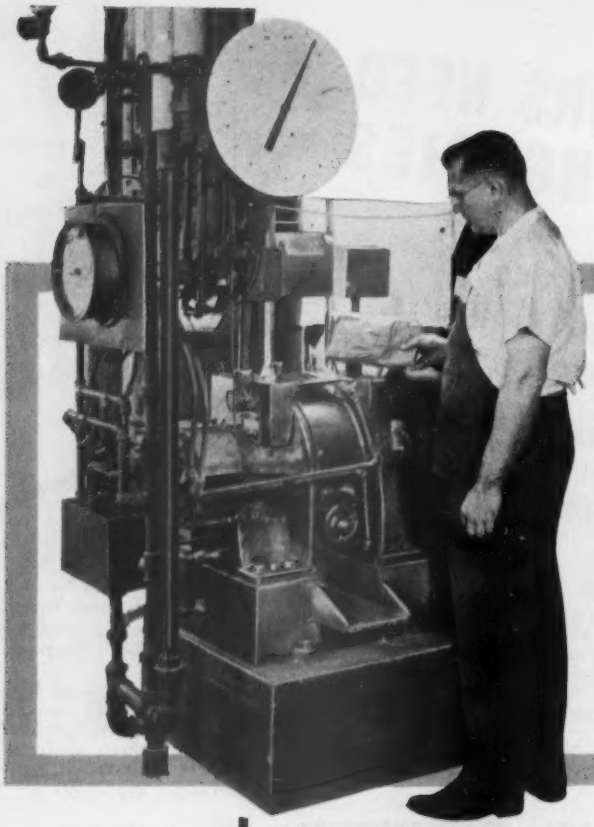
ACCURATE

STEEL RULE DIE MANUFACTURERS

24-28 West 21st Street, New York 10, N. Y. CHelsea 2-0860-1

Subsidiaries: American Fabricators; Interstate Die Cutting Co., Inc.

Intelligent Service to the Rubber Goods Industry for Over 22 Years



need MORE mixing capacity?

...try PROTOX* zinc oxides

You mix faster, turn out more zinc masterbatches per day, with Protox oxides than with conventional oxides.

HERE ARE THE REASONS WHY:

1. *Protox oxides are up to 33% denser.*
In Banbury mixing, they drop to the bottom of the chamber where the rubber can best incorporate them.

2. *Protox oxides are wetted faster by all types of rubbers.*
The zinc propionate coating, exclusively on Protox oxides, enables rubber to displace air quickly from the particles.

3. *Protox oxides disperse faster, more completely.*
Their coating definitely plasticizes the rubber, and increases the affinity of rubber for the particles.

How much can you increase your mixing capacity with Protox zinc oxides? Best way to find out is to take in a trial order now.

*U.S. Patents 2,303,329 and 2,303,330

THE NEW JERSEY ZINC COMPANY
Producers of Horse Head Zinc Pigments
... most used by rubber manufacturers since 1852
160 Front Street, New York 38, N. Y.

HORSE HEAD PRODUCTS

The finest name
in Rutile Titanium Dioxide

Glidden ZOPAQUE*-R

...gives you a whiter white...and it's easier to grind

Glidden research has achieved greater whiteness and a highly accelerated dispersion rate in new Glidden ZOPAQUE-R. These new developments combine to produce pigments with exceptional hiding power, outstanding gloss and color retention and low reactivity.

Write today for more details on new Glidden ZOPAQUE-R, the finest name in Rutile Titanium Dioxide.

ZOPAQUE-R33 — For latex paints
ZOPAQUE-R66 — All-purpose Rutile
ZOPAQUE-R88 — Non-chalking Rutile

THE GLIDDEN COMPANY

CHEMICALS • PIGMENTS
METALS DIVISION

Baltimore, Md. • Collinsville, Ill. • Hammond, Ind.
Oakland, Calif.

Another achievement of Glidden Planned Research

QUALITY Glidden PRODUCTS

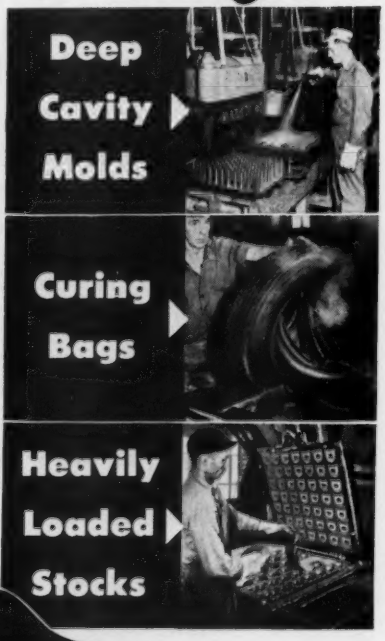
*Trade Mark Reg. U. S. Pat. Off.

DOW CORNING mold lubricants make mandrels come CLEAN

Moe Muscles doesn't know his own strength since the company switched to Dow Corning silicone release agents for mandrels. Inspector Mike is happy, too, because tubing strips cleaner than ever before. High interior surface finish and precise I.D.'s are the order of the day, while scrap has dwindled to the vanishing point. Mandrels stay clean from 5 to 20 times longer, too.

That's because Dow Corning silicones can't break down to form a carbonaceous build-up on mandrel or mold surfaces. Cleaning schedules are reduced, service life is lengthened, and maintenance costs are cut by as much as 80%.

For easier release and better quality in your own pressroom, specify Dow Corning silicone mold release agents: Emulsions for molds, mandrels and curing bags; Fluid for green carcasses and for bead and parting line release.



DOW CORNING SILICONES MEAN BUSINESS!

For more information call our nearest branch office or write direct for Data Sheet CM-3.

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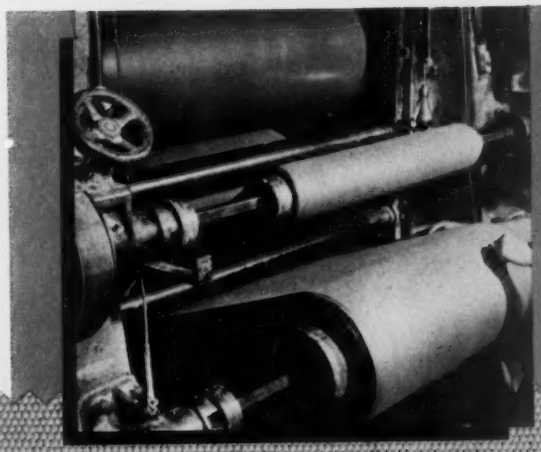

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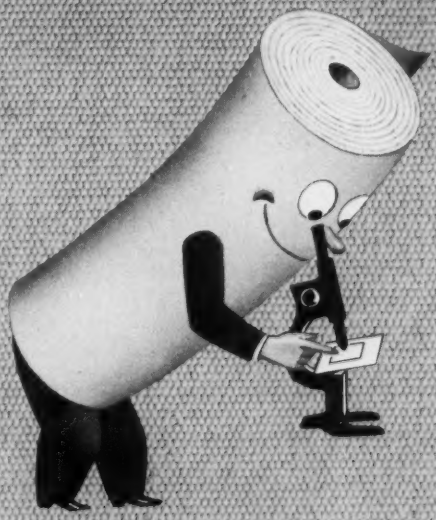
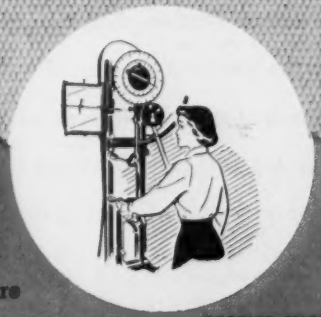
Makes The Big Difference In
INDUSTRIAL FABRICS

MT. VERNON FABRICS



GIVE YOU GREATER UNIFORMITY



Determining Yarn Tensile Strength with 300-lb. vertical test. One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

FABRICS ENGINEERED TO FIT YOUR NEEDS

Need adaptation of an existing fabric to your special purposes? Or creation of an entirely NEW fabric -- cotton, synthetic or blend -- to meet your specifications? Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

Mt. Vernon-Woodberry Mills

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How to "wrap up" *improved production*

● If your production involves the application or forming of wire, consider this . . .

Because specialists at National-Standard's Worcester Wire Works probe *deep* into the development and behavior of special-purpose wires, they're often able to suggest modifications that boost production plenty! Sometimes, for example, it's a modification that eliminates machine jamming and down-time. It might be a new or different finish that permits increased production speeds. Or, as often happens, it's an idea that gets the job done with *less* wire or other materials.

You can always count on Worcester Wire Works for service that goes further than usual — for special development help if you want it. And, in any case, you'll find in your National-Standard wire the uniformity, the adherence to specifications that in itself saves time and dollars!

NS NATIONAL-STANDARD NILES, MICHIGAN

DIVISIONS OF NATIONAL-STANDARD CO.

ATHENIA STEEL	*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD	*Niles, Mich.*	Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE	*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

Give your Paracril product

the right cure!

Whether you want excellent compression set characteristics, severe temperature resistance, or any of Paracril's many advantages, final product performance depends on the curative system you use.

COMMON CURATIVES—PER 100 R. H. C.

	#1	#2	#3	#4	#5
M-B-T-S	1.50	—	—	—	4.5
MONEX®	—	0.20	0.60	2.60	—
TUEX	—	—	—	—	3.0
Sulfur	1.50	1.50	1.00	0.55	0.2

#1 has been widely used as a general purpose curative where the best combination of Paracril properties is desired.

#2, slightly safer, is considerably lower in cost and emphasizes Paracril's good compression-set characteristics.

#3 is non-blooming and regarded as the best general purpose curative where 70 hour 212°F heat-aging and compression-set tests must be met.

#4 is particularly safe in normal hardness stocks. It is about equal to #5 for super-aging stocks and is considerably lower in cost.

#5 is specifically recommended for severe temperature service, where heat-aging, compression-set, and immersion tests at 250° and 300°F are specified.

Make sure you're getting *all* the advantages Paracril® offers *your* product. For more information on the use of curatives and antioxidants in Paracril, simply send the coupon below.

Naugatuck Chemical

Division of **UNITED STATES RUBBER COMPANY** • Naugatuck, Conn.

IN CANADA: NAUGATUCK CHEMICALS DIVISION
Dominion Rubber Company, Limited, Elmira, Ontario

Rubber Chemicals • Aromatics • Synthetic Rubber • Plastics • Agricultural Chemicals
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Naugatuck Chemical, 103 Elm Street, Naugatuck, Conn.
Please send Paracril Technical Bulletin No. 6 to:

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

A COMPLETE CYCLE OF OPERATION

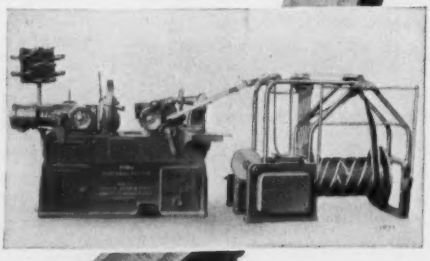
To make a bicycle all that is needed is some steel tubing, some wheels, a chain, pedals, ball bearings, gear wheels, spokes, a saddle, handlebars and various other accessories—not forgetting of course, the all important tyres which complete the job.

That is where we come into the picture—the Shaw Monoband Process is the fastest and most economical method of building Cycle Tyres with a wire bead. By this process, the complete tyre is built in one operation, including the application of the tread. It is, in fact, a complete cycle of operations for completing the cycle.

SHAW

MONOBAND PROCESS

SHAW



FRANCIS SHAW AND CO. LTD.,
MANCHESTER II, ENGLAND

Industry's headquarters for the best in Plastic & Rubber Machinery.

Pellet Quality...

[redacted]

SRF CARBON BLACK

The GENERAL ATLAS Carbon Co.

77 FRANKLIN STREET, BOSTON 10, MASS.

IF YOU WANT

- ★ EASIER PROCESSING
- ★ BETTER QUALITY
- ★ LOWER COST

in white sidewall compounds . . .
replace most of the zinc oxide with HI-SIL

Compounders of white side wall tires, who have been accustomed to running natural rubber or natural rubber-neoprene compounds loaded with titanium dioxide and zinc oxide, will do well to consider replacement of the latter pigment with Hi-Sil retaining only enough zinc oxide for activation.

Replacing most of the zinc oxide with Hi-Sil offers advantages in manufacturing white sidewall tires and results in better quality at lower cost.

THESE ARE AMONG THE ADVANTAGES YOU CAN EXPECT WITH HI-SIL

IN PROCESSING

1. **EASIER TO BUILD.** It is easier to build tires with Hi-Sil loaded white sidewall compounds; tires are not deformed in storage and handling.
2. **PREVENTS LIGHT SPOTS.** Tires having Hi-Sil loaded white sidewalls come out of the molds with fewer light spots because air is not trapped between the uncured tire and the mold.
3. **PREVENTS TORN SPOTS.** Tires having Hi-Sil loaded white sidewalls come out of the molds with fewer torn spots at the vents.
4. **EASIER TO BUFF.** Tires having Hi-Sil loaded white sidewalls have higher modulus and are easier to buff.

IN QUALITY

5. **MORE SERVICEABLE.** Hi-Sil loaded white sidewall stocks have better snag and tear resistance and are more resistant to curb scuffing.

IN COST

6. **LOWER VOLUME COST.** Hi-Sil has a lower pound cost than zinc oxide. Specific gravity of Hi-Sil is only 1.95 compared with 5.57 for zinc oxide.

Below are recipes and test results in replacements of ZnO in White Sidewall Compounds

PARTIAL REPLACEMENT OF ZnO WITH HI-SIL

Pale Crepe	100	MBTS	0.4
Zinc Oxide	40	DPG	0.35
Hi-Sil	16.5	Sulfur	2.9
Titanox A-MO	20.7	Stearic Acid	2
Ultramarine	0.2	Sunproof Wax	3

Color:	
Sunlamp, 120 hours	Equal to control
Outdoor Exposure, 7 weeks	Equal to control

Minutes Cure at 280°F.	Modulus 300%	Tensile	Elongation	Durometer Hardness	Tear lbs./in.
15	410	3040	660	43	290
20	570	3570	660	45	460
30	700	4070	660	49	480
45	740	4000	640	52	330
60	700	3800	630	52	350
90	740	3570	620	54	360
120	610	3570	620	53	310

REPLACEMENT OF ALL BUT ACTIVATION ZnO WITH HI-SIL

Pale Crepe	100	DPG	0.35
Zinc Oxide	10	Sulfur	2.9
Hi-Sil	27.1	Stearic Acid	2
Titanox A-MO	25	Diethylene Glycol	2
Ultramarine	0.2	Sunproof Wax	3
MBTS	0.4		

Color:	
Sunlamp, 120 hours	Better than control
Outdoor Exposure, 7 weeks	Better than control

Minutes Cure at 280°F.	Modulus 300%	Tensile	Elongation	Durometer Hardness	Tear lbs./in.
10	790	3660	630	54	490
20	1040	3800	600	60	400
30	940	3500	580	61	410
45	890	3460	580	61	380
60	910	3220	580	63	350
90	820	3300	600	60	420
120	820	3290	610	60	340

Improve your white sidewall production by using Hi-Sil in your compounds. Columbia-Southern's Technical Staff will be glad to assist you in getting started, or will offer recommendations on any of your rubber compounding problems. You are invited to wire, telephone, or write today!

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

EXECUTIVE OFFICES: FIFTH AVENUE AT BELLEFIELD, PITTSBURGH 13, PA. TELEPHONE MAYFLOWER 1-2960

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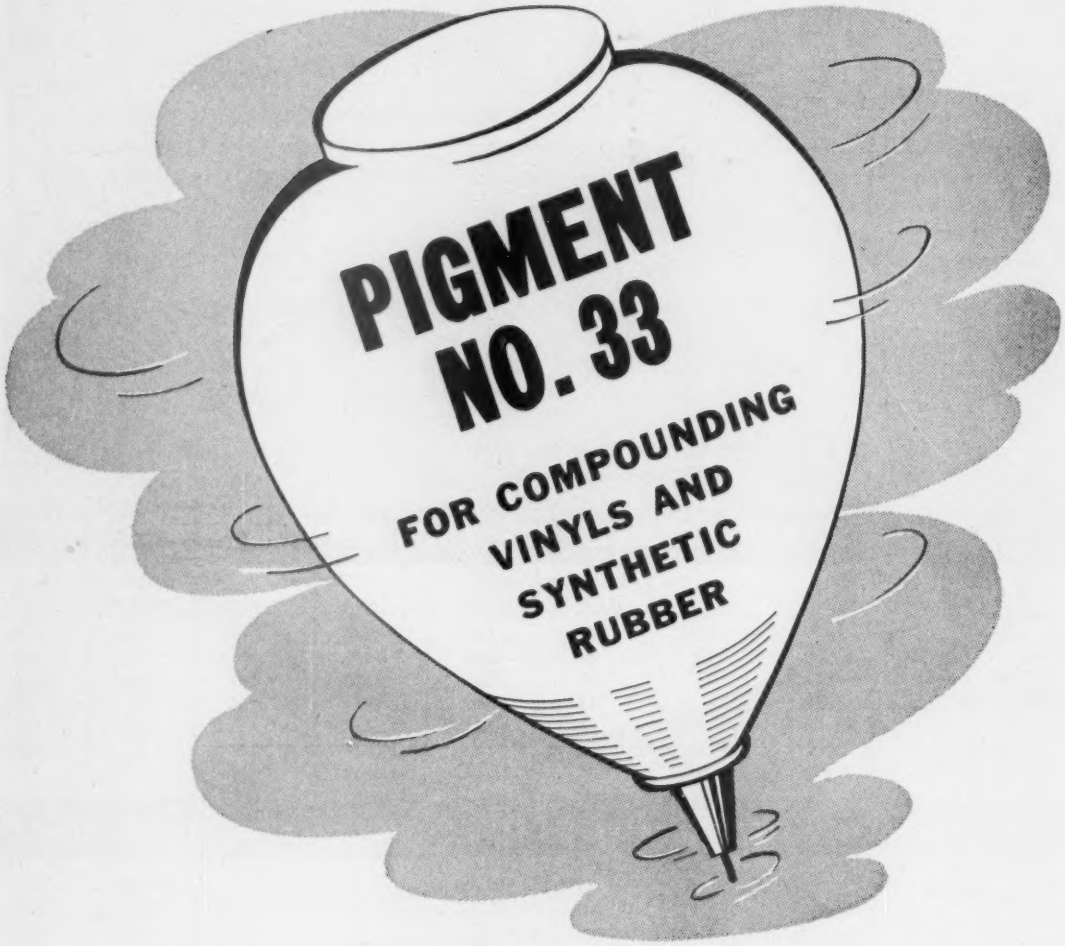
IT'S "TOPS"



• SUPERIOR ELECTRICAL TESTS
• HEAT STABILITY
• COLOR

Sample and technical data sent promptly on request

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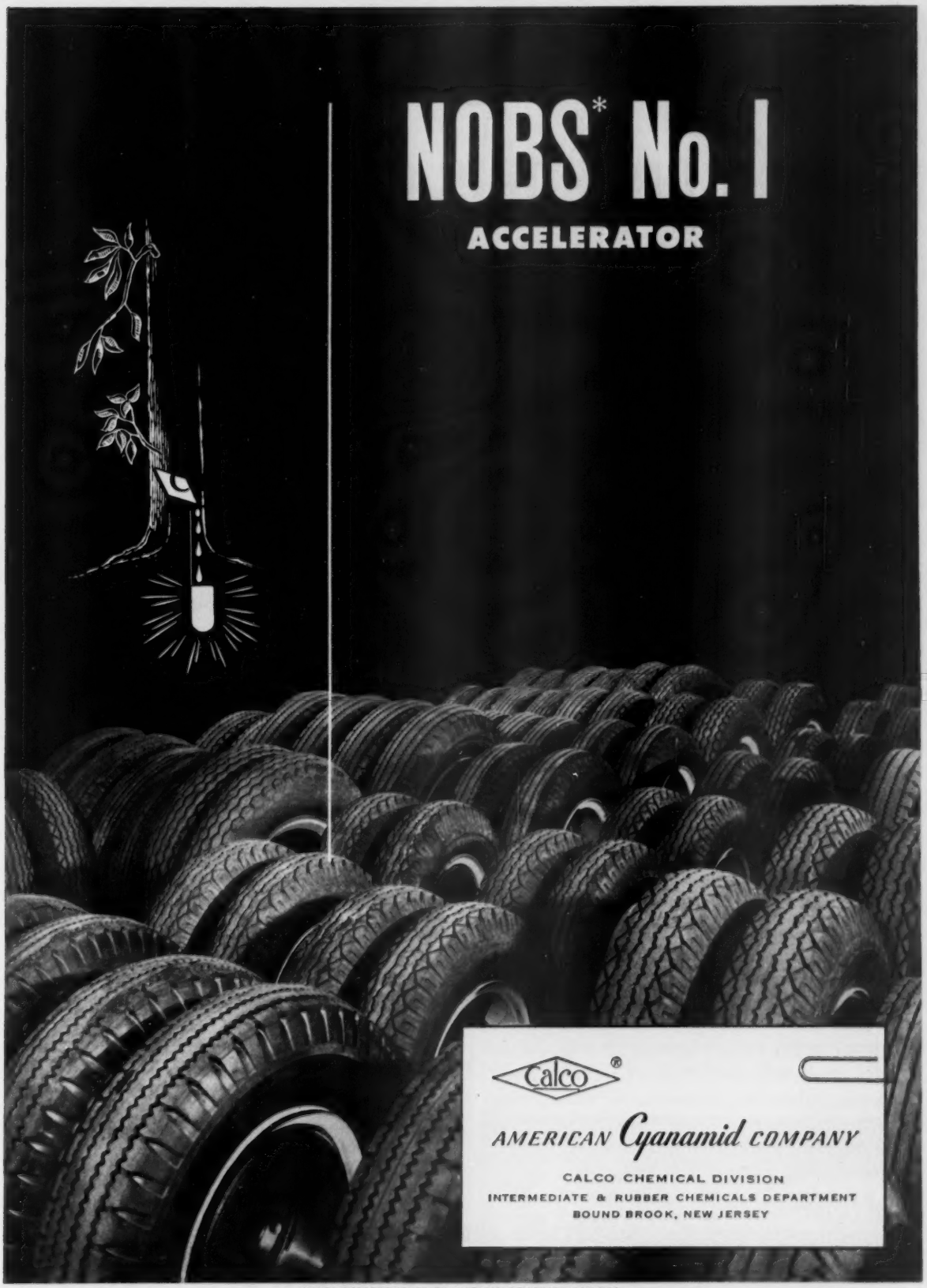
NOBS* No. 1

ACCELERATOR



Calco®

AMERICAN Cyanamid COMPANY

CALCO CHEMICAL DIVISION
INTERMEDIATE & RUBBER CHEMICALS DEPARTMENT
BOUND BROOK, NEW JERSEY

SALES REPRESENTATIVES AND WAREHOUSE STOCKS

Akron Chemical Company, Akron, Ohio • Ernest Jacoby and Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill.
H. M. Royal, Inc., Los Angeles, Calif. • H. M. Royal, Inc., Trenton, N. J. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

When ordering GR-S Rubbers specify polymers extended with Sundex-53 and Circosol-2XH

Sundex-53 and Circosol-2XH offer you the assurance of polymer uniformity, plus the advantages of the most favorable physical characteristics of the finished vulcanizates.

Minimum downgrading of the polymers takes place during compounding and long storage of raw polymers when these two Sun products are used as extenders.

SUNDEX-53 is a relatively aromatic process aid. Its plasticizing action provides good processing in Banbury and mill mixing. Sundex-53 is highly compatible with natural rubber, GR-S, reclaims and all combinations of these three.

Oil masterbatch polymers with Sundex-53

New Number	Old Number	
X-740	X-712	25 parts Sundex-53, 50/50 rosin/fatty acid emulsified
X-743	X-713	25 parts Sundex-53, rosin acid emulsified
X-737	X-716	37.5 parts Sundex-53, 50/50 rosin/fatty acid emulsified
X-724		37.5 parts Sundex-53, rosin acid emulsified

CIRCOSOL-2XH is a relatively naphthenic process aid. Its plasticizing action is not quite as great as that of Sundex-53. However, its nonstaining characteristics permit wider application. With small amounts of peptizers, Circosol-2XH provides desirable processing stocks.

Oil masterbatch polymers with Circosol-2XH

New Number	Old Number	
X-738	X-628	25 parts Circosol-2XH, 50/50 rosin/fatty acid emulsified
X-745	X-693	25 parts Circosol-2XH, 50/50 rosin/fatty acid emulsified; nonstaining
X-747	X-717	37.5 parts Circosol-2XH, rosin acid emulsified
	X-718	37.5 parts Circosol-2XH, fatty acid emulsified
X-735	X-722	37.5 parts Circosol-2XH, rosin acid emulsified; nonstaining

Oil black masterbatch polymer with Circosol-2XH

New Number	Old Number	
X-746	X-629	25 parts Circosol-2XH, 50 parts HAF carbon black

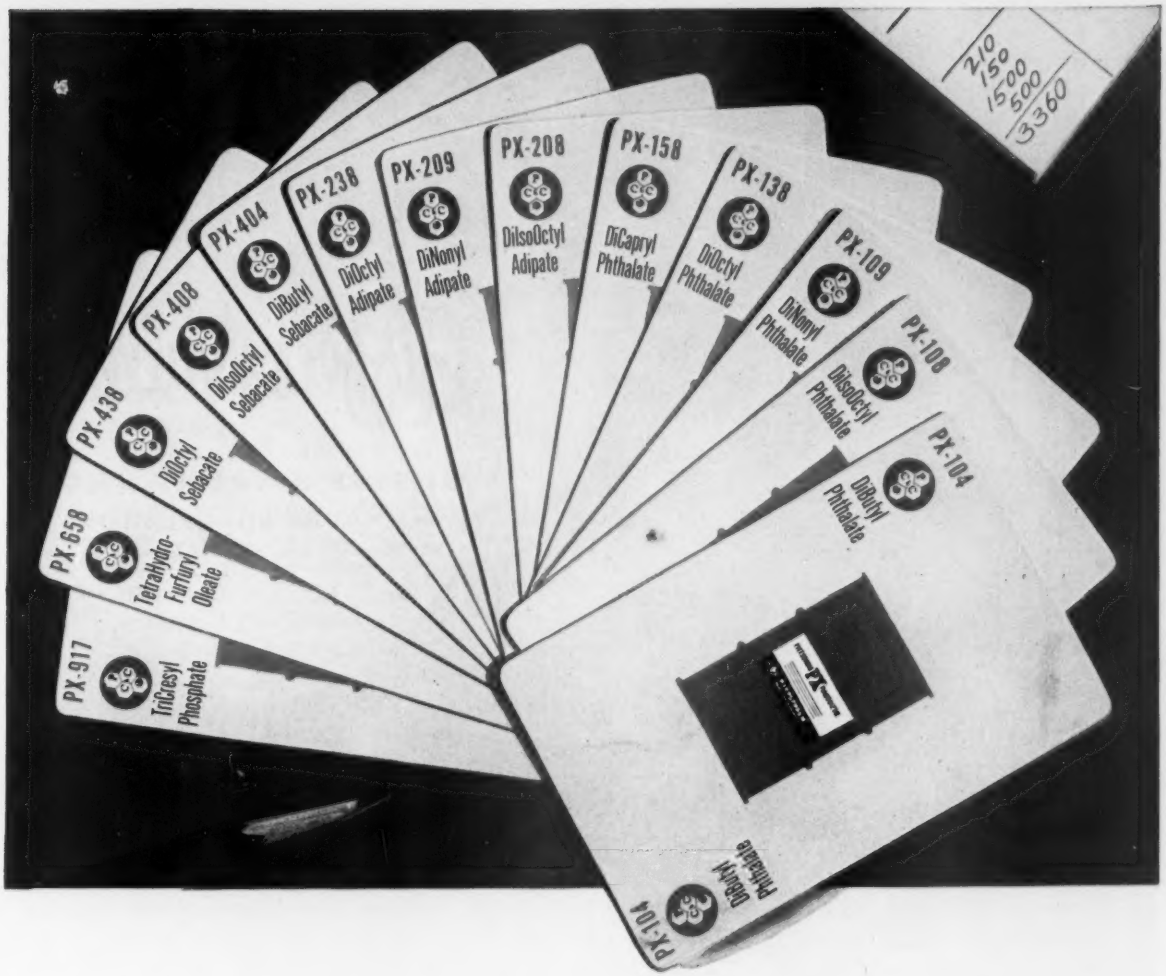
For more information write Department RA-3

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

SUNOCO®

PHILADELPHIA 3, PA. ◆ SUN OIL COMPANY LTD., TORONTO & MONTREAL



A Perfect Hand if you're bidding

for peak Plasticizer performance

Whatever your plasticizer needs, you'll find Pittsburgh Coke & Chemical the *basic* source you can count on—for wide choice, for consistent peak performance and for prompt, continuing deliveries.

Whether you're buying Pittsburgh PX Plasticizers by the drum or by the carload, you'll benefit by our unique coal-to-finished plasticizer production control. With this assured quality as a starter, there's a good chance our engineers will be able to help you further increase your product quality and reduce production costs through better plasticizer selection and application. ● *Why not call or write us about it today?*

Do you have your copy of this VALUABLE BOOK?

Contains useful data on the plastics industry, the role of plasticizers in the industry, and descriptions and recommended applications of Pittsburgh PX Plasticizers. Write for your free copy today!

PLASTICIZER DIVISION

PITTSBURGH
COKE & CHEMICAL CO.
Grant Building · Pittsburgh 19, Pa.

WAD 4552

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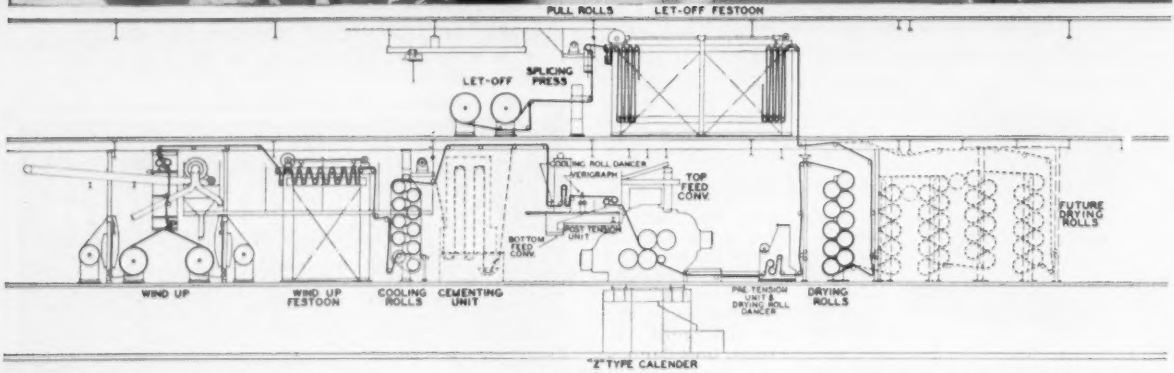
SEE
WHAT They SAY
ABOUT
Giffels & Vallet

GIFFELS & VALLET, INC.
INDUSTRIAL ENGINEERING DIVISION
1000 Marquette Bldg. • Detroit 26, Michigan



NEW "Z" CALENDER TRAIN

THE GOODYEAR TIRE & RUBBER CO. • AKRON, OHIO

This Farrel-Birmingham "Z" Calender*

"INSURES UNMATCHED UNIFORMITY OF QUALITY" in double-coating tire fabric

THE GOODYEAR TIRE & RUBBER COMPANY, in describing its new Farrel-Birmingham "Z" calender train, says, "It coats fabric on both sides at the same time, evenly, automatically, at constant speed, under constant weight and tension – *insures unmatched uniformity of quality.*"

To provide this "unmatched uniformity of quality" both the upper and lower roll pairs of the calender are equipped with motorized crossed-axes devices for fine adjustment of roll "crown." Hydraulic pullbacks hold the rolls in positive operating position.

Double-coating of tire fabric is only one of the jobs in which Farrel-Birmingham "Z" calenders are establishing new standards for accuracy. They have proved to be equally outstanding for the high-speed production of rubber and plastic film and sheet, and for single coating.

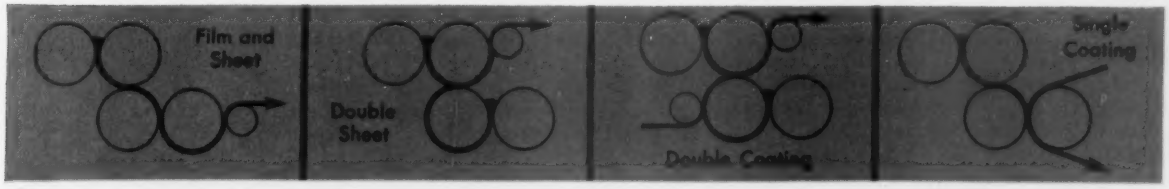
Send for more information about this revolutionary development – the "Z" calender. Or, if you prefer, a Farrel-Birmingham engineer will be glad to discuss your calendering problems with you.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

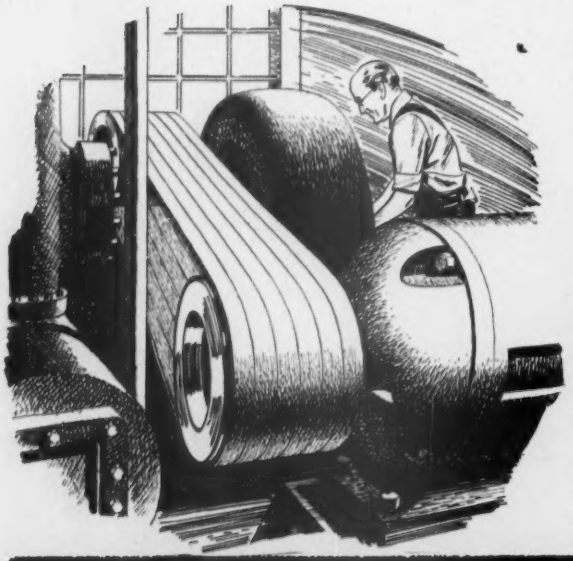
Artist's drawing of Farrel-Birmingham 28" x 70" four-roll "Z" calender double-coating tire fabric at Goodyear. This installation, which was engineered by Giffels & Vallet, Inc., Industrial Engineering Division, of Detroit, is designed for a production speed of 100 yards per minute.

FB-806

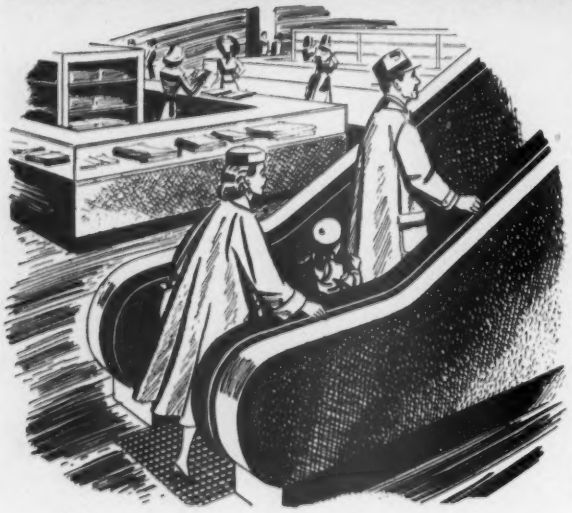


* The "Z" calender is an original development of Farrel-Birmingham Company, Inc. When you think of the "Z" calender you are thinking of Farrel-Birmingham.

Farrel-Birmingham®



If it's got to be a real ALL-AROUND PERFORMER..



make it "SHAWMUT BELTING DUCK"

another Wellington Sears fabric for the rubber industry

Year after year Shawmut Belting Duck continues to supply the answer to a variety of rubber-and-fabric problems. It's specified wherever great longitudinal strength, good adhesion and bulking properties and economical cost are needed.

This sturdy, pliable belting owes its strength to the precisely controlled construction and twist of the rugged plied yarns in the warp and filling. It's produced by a mill that has specialized in heavy-duty fabrics for more than 100 years.

Shawmut Belting Duck is just one of many famous Wellington Sears cotton ducks for belting and other mechanical rubber products. The use of Superior Army Duck as a cover fabric for V-belts is another example.

Wellington Sears has the answer, too, for special problems, such as the need for exceptional troughing qualities in conveyor belts, or power transmission belts combining unusual strength with minimum weight and bulk. We have developed fabrics to utilize the unique properties of nylon, high-tenacity rayon and other fibers.

Typical fabrics for the rubber industry are at the right. A call or letter to your nearest Wellington Sears office will place full information at your disposal. Let's talk it over.

Superior Fabrics for the Rubber Industry

- Belting duck
- Hose duck
- Enameling duck
- Army duck
- Single and two-ply chafers
- Sheeting
- Airplane cloth
- Balloon cloth
- Nylon, high-tenacity rayon, other synthetics and blends.

Wellington Sears

A SUBSIDIARY OF *WEST POINT MANUFACTURING COMPANY*

FIRST In Fabrics For Industry

WELLINGTON SEARS COMPANY, 65 WORTH STREET, NEW YORK 13, N. Y.

OFFICES IN: ATLANTA • BOSTON • CHICAGO • DETROIT • LOS ANGELES • NEW ORLEANS • PHILADELPHIA • SAN FRANCISCO • ST. LOUIS

CABOT

Declared NONtoxic by F.D.A.*

DI-ISO-BUTYL ADIPATE

Cabflex Di-BA

*Nontoxic means "suitable" for use in food packaging materials.

"Suitability means that under the conditions of use, and in the amounts now employed to produce a finished film, di-iso-butyl adipate has such a low order of solubility as to be insignificant as a food contaminant when weighed in the light of the toxicological evidence."

". . . this plasticizer has had adequate pharmacological study demonstrating its harmlessness in the amounts now used in finished commercial films . . ."

Reprinted from Association of Food & Drug Officials of the United States Vol. XV, No. 3, July 1951

Cabflex Di-BA
di-iso-butyl adipate

Cabflex Di-OP
di-iso-octyl phthalate

Cabflex DCP
di-capryl phthalate

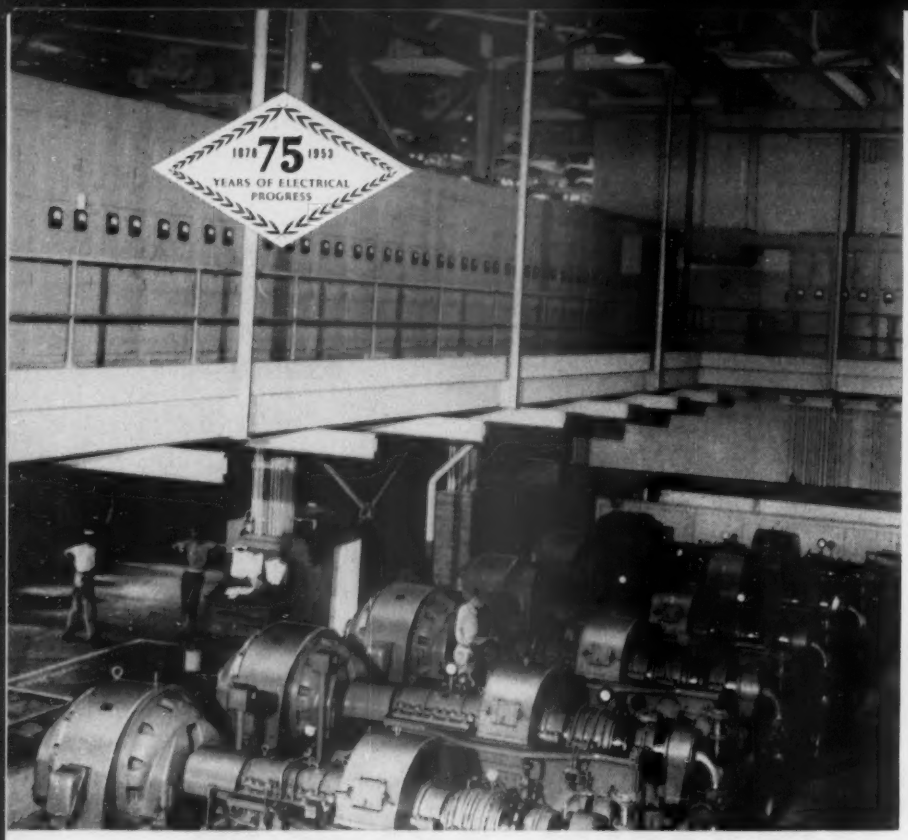
Cabflex DDP
di-decyl phthalate

Cabflex Di-OA
di-iso-octyl adipate

Cabflex DDA
di-decyl adipate

Cabot produces the nontoxic plasticizer Cabflex Di-BA and does not make the finished film.

Plasticizer Division
GODFREY L. CABOT, INC.
77 FRANKLIN STREET, BOSTON 10, MASS.



G-E LIMITAMP controls operation of synchronous and induction motor drives—will protect equipment under short-circuit conditions as high as 250,000 KVA.

G-E Limitamp Control—

Provides Greater Safety At High Voltages

G-E Limitamp is a high voltage motor starter providing interrupting capacity up to 4800 volts . . . gives you quick, silent short-circuit protection for motors up to 2250 hp.

Heavy duty air-break contactors with improved arcing structure permit a rapid duty cycle for millions of operations . . . require little maintenance.

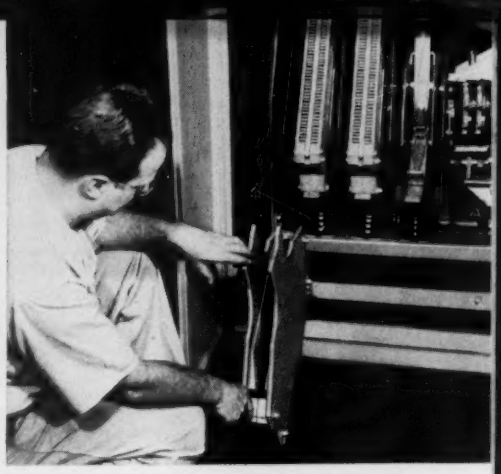
High interrupting capacity plus fast-acting, specially developed EJ-2 fuses, (which limit fault current to less than ¼ cycle,) provide complete motor protection . . . prevent costly shutdowns.

For safety of maintenance personnel high and low voltage compartments are separated by a steel barrier. Mechanical door interlocks assure motor circuit interruption before the fuse compartment door can be opened.

G-E engineers study your requirements . . . design all components into a co-ordinated "package" that will give you adequate interrupting capacity for your system.

G-E Limitamp controls are delivered totally assembled, ready for service and need only be put in place, the leads connected, fuses inserted . . . the control is ready to operate.

For complete information contact your G-E Representative, or write for Bulletin GEA-5409A, General Electric Co., Sec. 781-3, Schenectady 5, N. Y.



MAINTENANCE IS EASY—for example: arc shutes can be removed quickly, contact tips inspected, and your Limitamp control is right back in operation.

SIMPLE TO OPERATE—G-E Limitamp control permits pushbutton operation for manual starting and stopping while meters provide a quick check on load.

FUSES ARE EASILY REPLACED—when the fuse swings forward on its hinge, it is easily lifted out and quickly replaced with the help of a switch hook.

You can put your confidence in—

GENERAL ELECTRIC

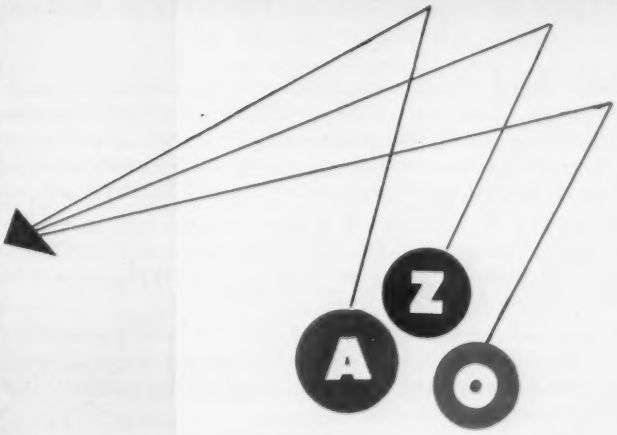
AZO-ZZZ-55

zinc oxide

An easy processing zinc oxide. Uniform particle size and absence of extreme "fines" assures good dispersion in rubber.

AZO

zinc oxides for every rubber need



AMERICAN ZINC SALES CO.

Distributors For

AMERICAN ZINC, LEAD & SMELTING CO.
COLUMBUS, O. CHICAGO
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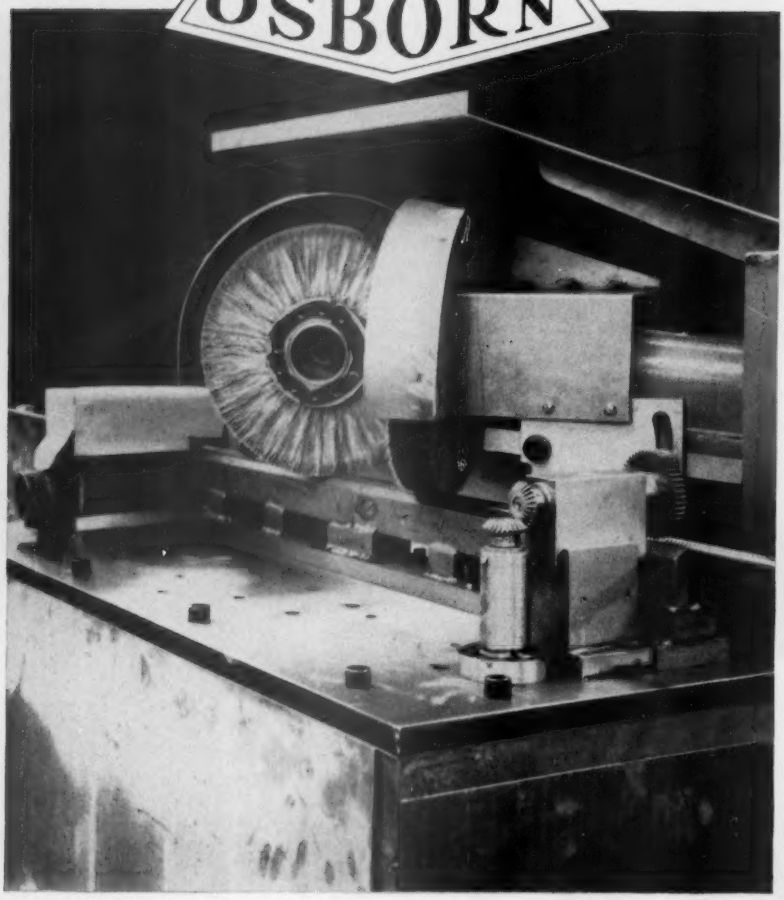
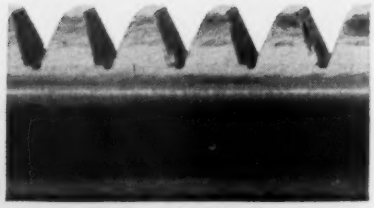
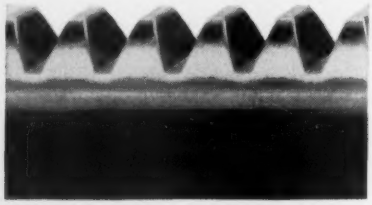
OSBORN







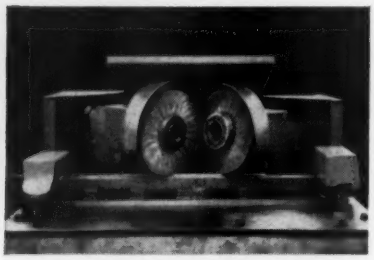
BEFORE AND AFTER. Top view shows closeup of rack teeth with light burrs and rough surface before brushing by new "push-button" method. Center view shows closeup of rack in machine after completion of brushing. Bottom view shows teeth after brushing. Note uniform surfaces and smooth finish on all teeth.

Formerly 50 minutes...
Now brush-deburred in 6 minutes

8 times as fast . . . more uniform deburring . . . finer surface finish. These are the advantages gained by a large machinery manufacturer with an automatic power-brushing method. The part: a rack gear, 17 ft. long with more than 1000 teeth. The job: light deburring of machine-cut teeth, and blending the junctures of intersecting surfaces to form smooth curves in place of fragile, sharp edges.

With the help of their **O**sborn **B**rushing **A**nalyst, they devised the machine shown above. This automatically controlled machine with two heads of Osborn Fascut® brushes does the entire job in 6 minutes. Burr removal and surface juncture blend are far superior to former methods.

This is typical of thousands of cases where production is being vastly improved with Osborn power brushing methods. Find out how you can cut *your* costs! Call in your **OBA** today or write *The Osborn Manufacturing Company, Dept. BB-1, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



HOW IT'S DONE. Two rotating Osborn power brushes, engage rack teeth at angles as shown. At push of button, rack drives through machine at about 5 ft. per minute. When the rack completes passage, the drive reverses and sends it back in the other direction. On return travel of part, the direction of brush rotation is reversed to contact surfaces on the opposite side of rack. This gives both sides of teeth uniform brushing.

WHAT'S YOUR PROBLEM? The nearby Osborn Brushing Analyst is experienced in working with machine designers and methods engineers to solve problems with the latest power brushing techniques. Feel free to call him for help!

Osborn Brushes®

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

Introducing

HARSHAW

VINYL STABILIZERS

to the vinyl plastic and coating industries

Harshaw, a pioneer and outstanding producer of metal organic chemicals, for more than 50 years, now offers broadly tested special products of controlled uniformity to assist vinyl resin processors in formulating heat and light stabilized systems efficiently, effectively and economically.

Let us know your interest in processing and stabilizing clear or pigmented vinyls in

Calendered Films, Sheets, Non-rigid Extrusions, Plastisols, Organosols, Coatings, Solutions, Rigid Extrusions.

From this list of heat and light stabilizers, we will be glad to suggest a typical stabilizing system* for the vinyl resin you process, and will furnish samples for your trial.

*Harshaw vinyl stabilizing systems comprise small amounts of two or more stabilizers, selected to give the required control against vinyl degradation.

Barium-Cadmium: 12-V-5, 128-V-5
Latest two developments of effectively modified co-precipitated laurates for high heat and light stabilization. Fine white powders.

Cadmium: 2-V-4, 2-V-7
Organic complexes for outstanding clarity. Clear pale liquids. Frequently used with barium and organic stabilizers.

Barium: 1-V-4
White powdered highly compatible barium compound. Does not bloom or plate-out of calendered stocks. Improves viscosity stability in plastisols. Frequently used with cadmium stabilizers with or without organic assistants.

Organic: 8-V-3, 8-V-5
Organic non-polymeric clear stabilizer assistants for use with barium-cadmium or cadmium stabilizers to further increase heat and light stabilizing efficiency.

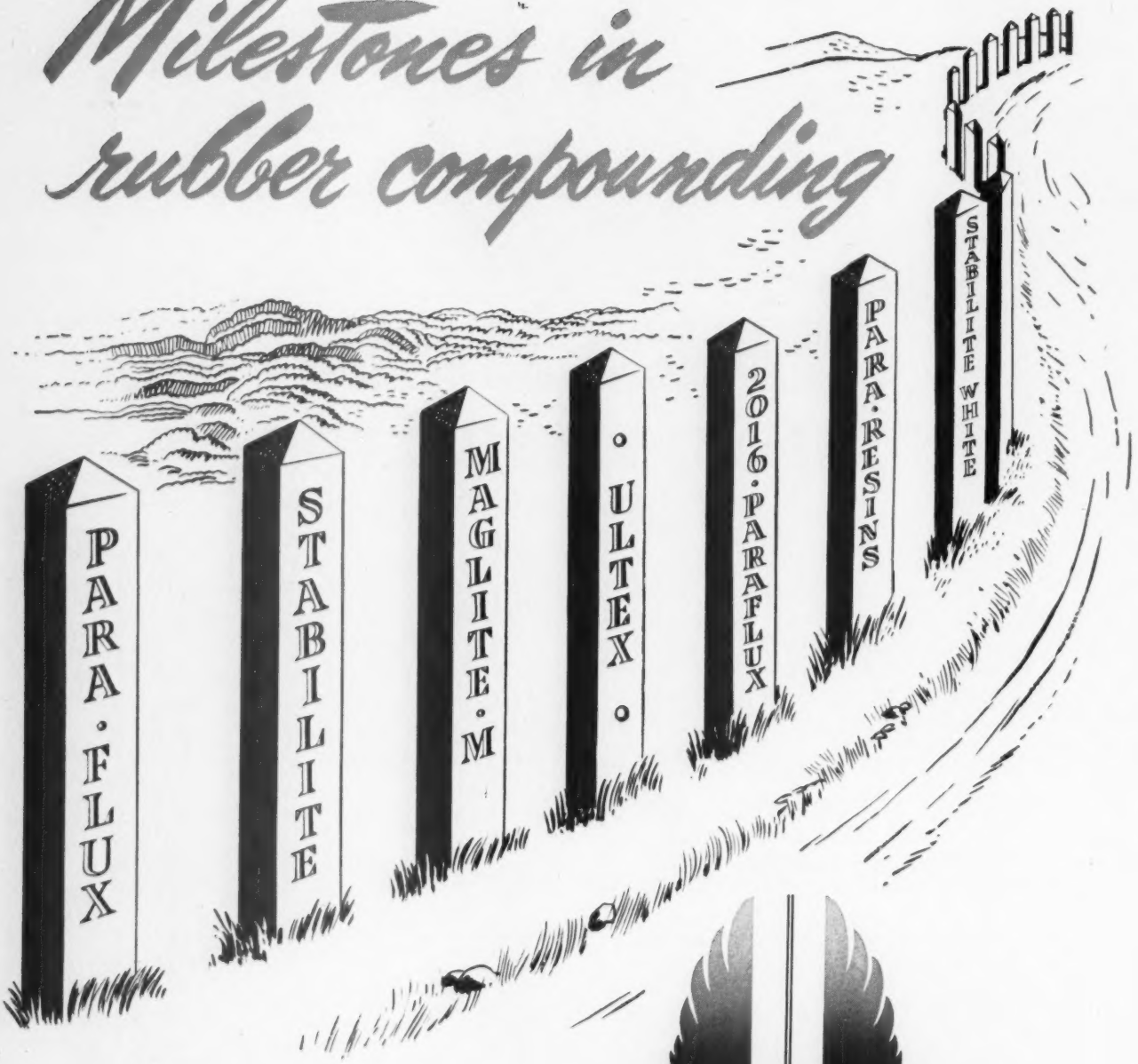
Organic: 7-V-1
Organic polymeric clear liquid particularly useful in extending heat stabilization. Outstanding for organosols and solution applications. Extends many times the effectiveness of light stabilizers.

Other special products available:

Zinc 9-V-1 (organic complex) **Cadmium 2-V-8** (selected laurate)
Barium 1-V-3, & Calcium 5-V-1 (dispersible stearates)
Lead Stearate Fused 102 **Aluminum Stearate 72**

THE HARSHAW CHEMICAL CO.
1945 East 97th Street, Cleveland 6, Ohio
BRANCHES IN PRINCIPAL CITIES

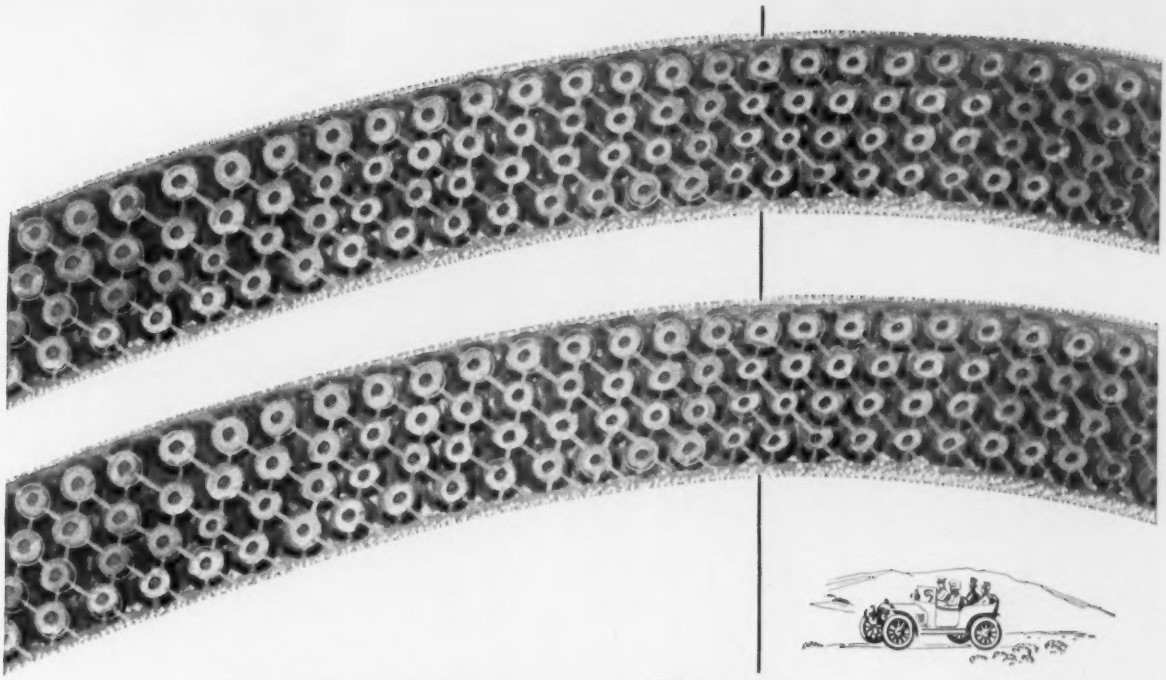
Milestones in rubber compounding



and many more to come....

The C. P. Hall Co.
CHEMICAL MANUFACTURERS

AKRON, OHIO • LOS ANGELES, CALIFORNIA • CHICAGO, ILLINOIS



REMEMBER THIS *tread?*

It is the "Vacuum Cup" tread, introduced by The Pennsylvania Rubber Company of America, in the early days of motoring.

The "Vacuum Cup" tread was a significant stride in the early efforts of the tire industry to build greater traction into automobile tires. And many of you will remember—perhaps with nostalgia—the familiar "sing" of a "Vacuum Cup" tire on the highway.

We remember the tire well, at Bridgwater. From our shops came molds to produce it. And down through the years—since 1906, in fact—The Bridgwater Machine Company has consistently worked with the tire industry, furnishing quality-built molds for the more efficient production of many well-known tires of both yesterday and today.

Our Athens Machine Division, in Athens, Ohio, is, we believe, the only plant in the world devoted exclusively to tire mold manufacture. Here, skilled workmen and specialized machines, many of our own design, produce molds of any type or size, in engraved steel, cast iron or aluminum.

Here, unhampered skills of Bridgwater craftsmen are focused on making tire molds of superlative quality and precision—at decidedly favorable cost.

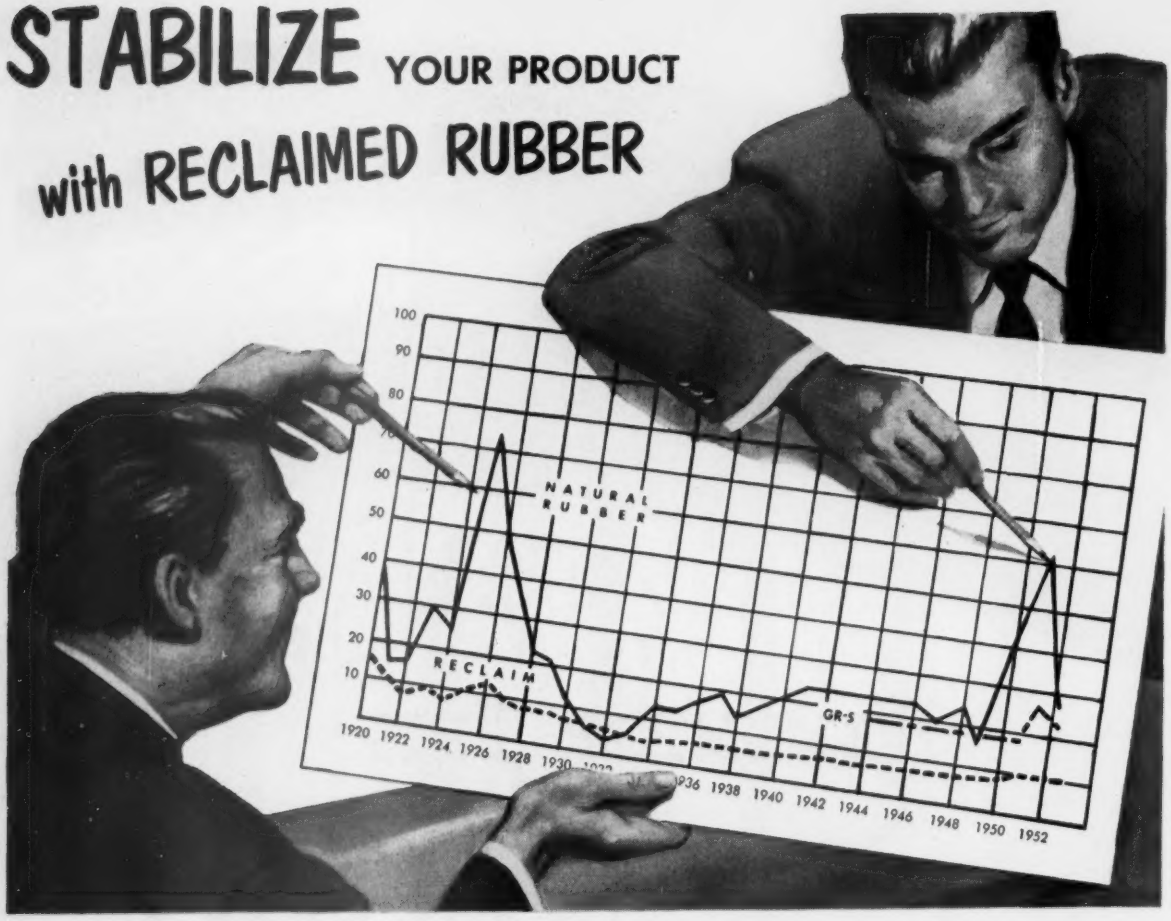
ATHENS MACHINE DIVISION

THE BRIDGWATER MACHINE COMPANY

Akron, Ohio

1755

STABILIZE YOUR PRODUCT with RECLAIMED RUBBER



U.S. RECLAIMS help industry *Economize*

. . . without sacrifice of quality!

The chart above graphically illustrates GR-S and natural rubber prices as opposed to reclaimed rubber prices over the past 32 years!

The ups and downs of that natural rubber graph have spelled a lot of headaches and heartaches for manufacturers f[illegible]re than a quarter of a century . . . and, these manufacturers could have minimized their troubles by using a substantial percentage of reclaimed rubber in their formulae. You can always depend on reclaimed rubber . . . in performance AND in price. In price, it has *practically* maintained its status quo during that period and, in performance, reclaimed rubber has *consistently* maintained its high standards of quality and uniformity.

Today, reclaimed rubber will give you FASTER mixing, EASIER processing and STABILIZED quality, production and costs! Whatever you make out of rubber, there is very probably a U. S. RECLAIM that will, wartime or peacetime, help you STABILIZE your production picture and MAKE YOUR NEW RUBBER GO FARTHER.

Always keep reclaims in your formula and always look to U. S. for the best. U. S. Rubber Reclaiming Company, Inc., P. O. Box 365, Buffalo 5, N. Y. Trenton agent: H. M. Royal, Inc., 689 Pennington Ave., Trenton, N. J.

70 years serving the industry solely as reclaimers

U.S. RUBBER RECLAIMING COMPANY, INC.

4 ways you benefit from WITCO-CONTINENTAL Channel Blacks

Continental AA (EPC)
Witco No. 12

Continental A (MPC)
Witco No. 1

Continental F (HPC)
Witco No. 6

Continental R-40 (CC)

1. *Highest Quality*
2. *Complete service*
3. *Dependable supply*
4. *Immediate delivery*

(hopper car or palletized bags)

WITCO CHEMICAL COMPANY

CONTINENTAL CARBON COMPANY

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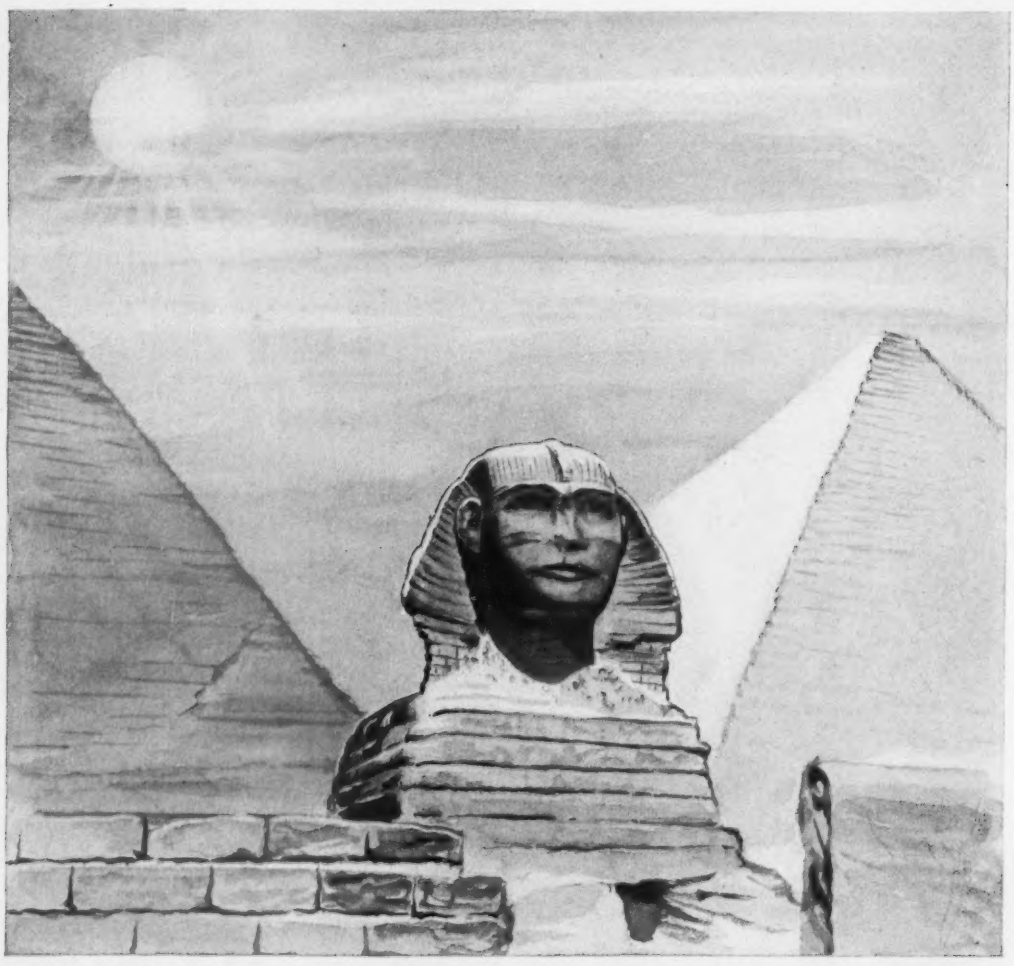
Los Angeles • Boston • Chicago • Houston • Cleveland

San Francisco • Akron • London and Manchester, England



HARFLEX® PLASTICIZERS

OUTSTANDING FOR WEATHERING STABILITY

With the endurance so vital to long range heat and sunlight resistance

For Plasticizers of QUALITY write:

HARCHEM

41 EAST 42nd STREET, NEW YORK 17, N. Y.

THE KEY TO HARCHEM® BETTER PLASTICS

HARDESTY CHEMICAL DIVISION
W. C. HARDESTY CO., INC.

Manufacturers of Sebacic Acid

Canadian Distributor: W. C. Hardesty Co. of Canada Ltd., 975 Lakeshore Road, New Toronto, Canada

R.D. Wood Hydraulic Presses

"... that industrial equipment which has maintained high excellence in manufacture will continue to be sold, and will contribute its worth to uplifting the general quality of everything produced in industrial America ..."

1,327-ton, multiple-opening, duplex cylinder type hydraulic platen press for the manufacture of molded brake lining and similar products. *Write for catalogs of our hydraulic presses.*

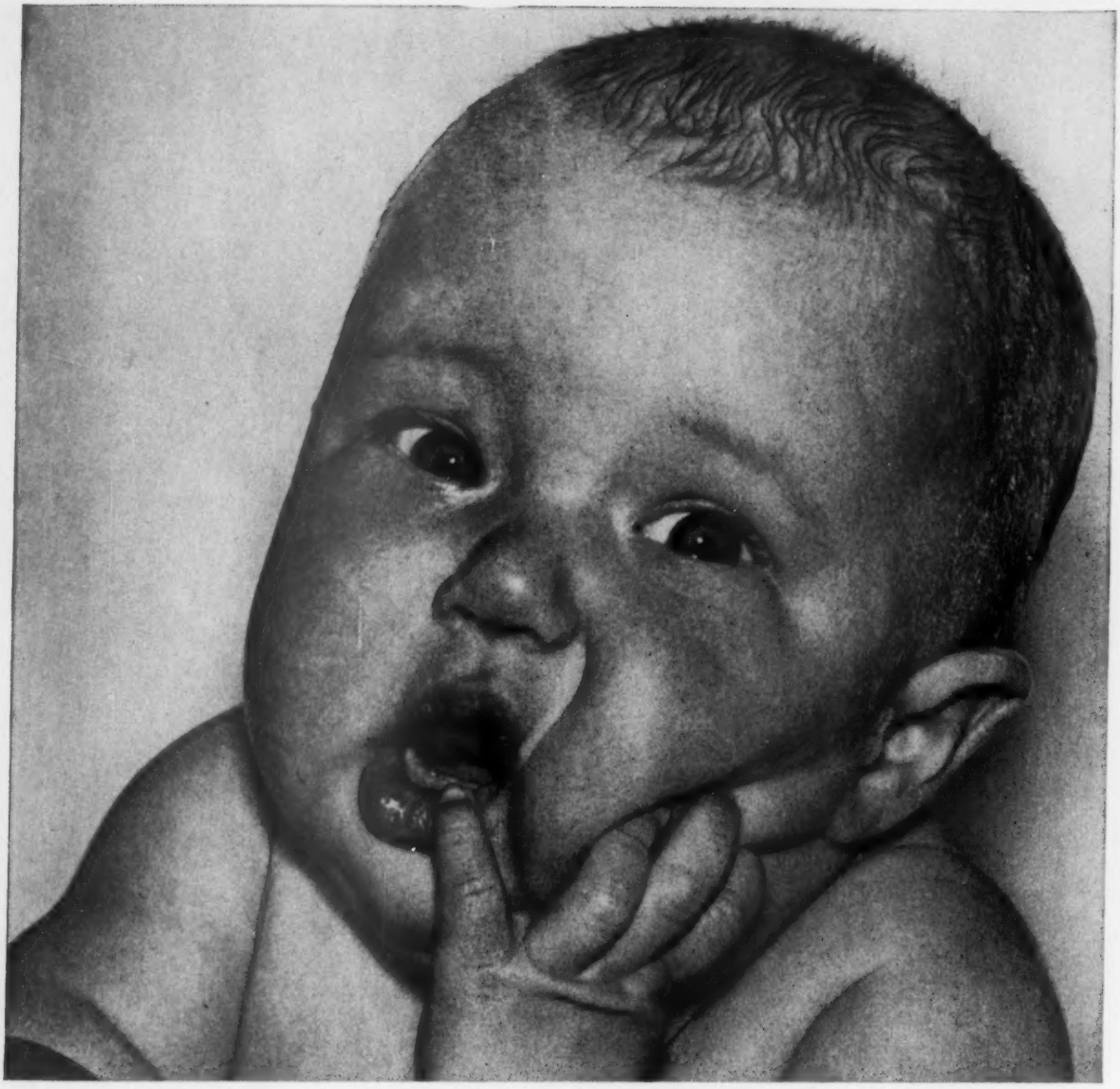
150th anniversary

WOOD

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING, PHILADELPHIA 5, PA.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ALLEVIATORS • INTENSIFIERS



Now let's see...did I or did I not remember to specify Barrett?

BARRETT IS BASIC... It pays you to buy from Barrett—the world's leading producer of coal-tar chemicals. You are assured uniform quality, steady supply and quick delivery.

Services of the Barrett Applications Research Laboratory are available without cost to customers requiring assistance on application problems.

BARRETT CHEMICALS FOR THE RUBBER INDUSTRY

BARDOL* Rubber Compounding Oil
"BARDOL" B Rubber Compounding Oil
Dispersing Oil 10
CUMAR* Resin
BRC* 20 Rubber Compounding Pitch
"BRC" 30 Rubber Compounding Pitch
BRV* Rubber Softener
BRT* 3 Rubber Reclaiming Tar
"BRT" 4 Rubber Reclaiming Tar
Resin "C" Resinous Compounding Material
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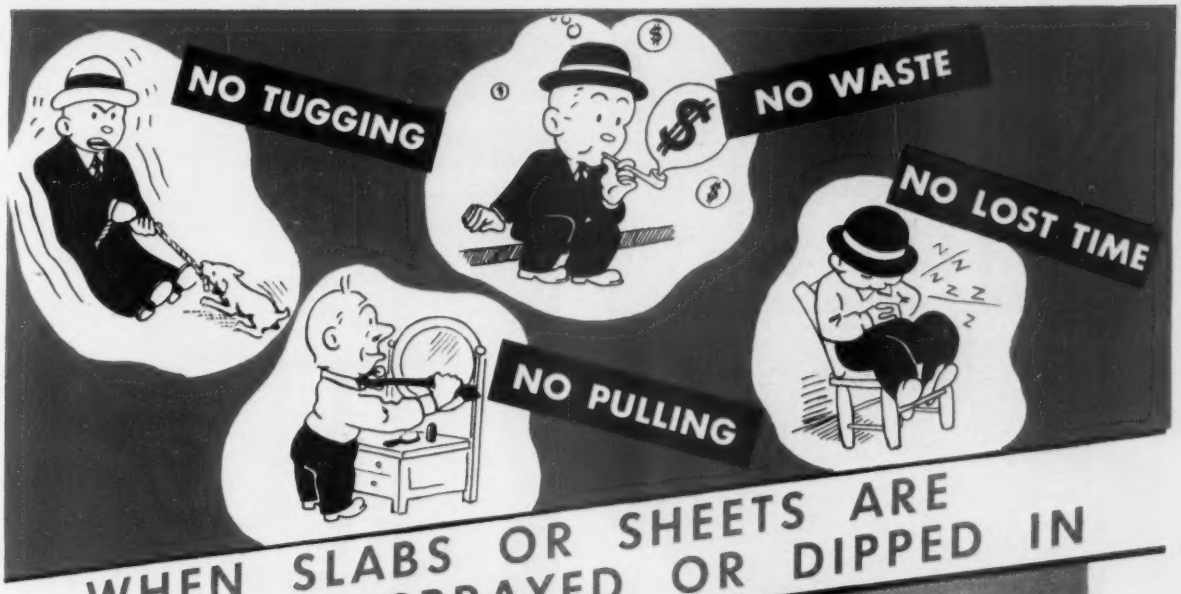

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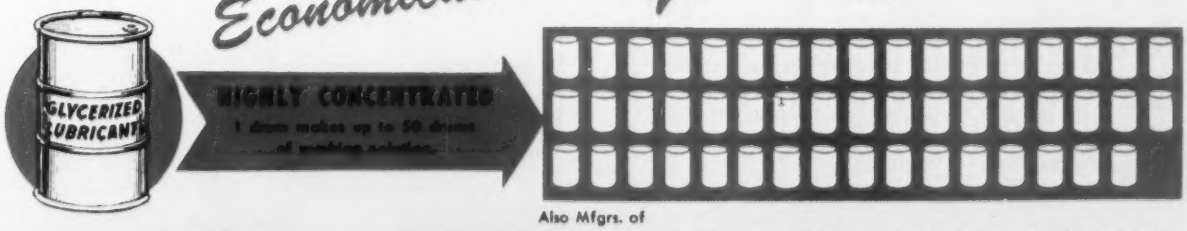

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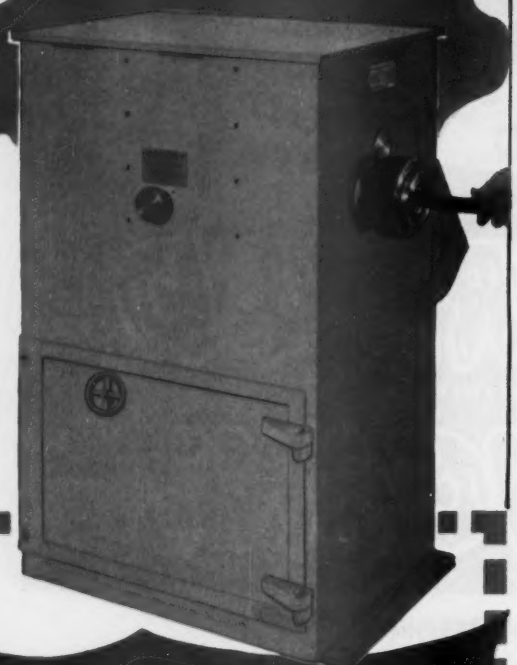

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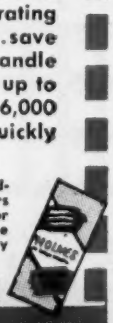

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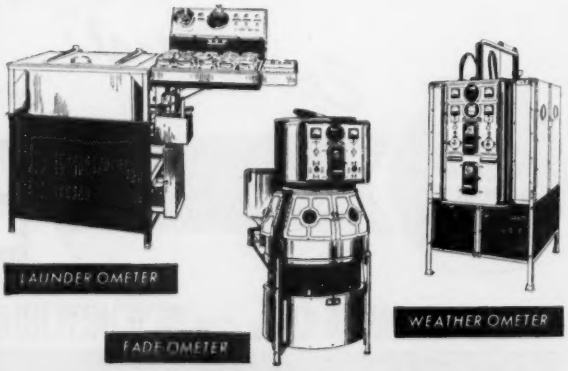

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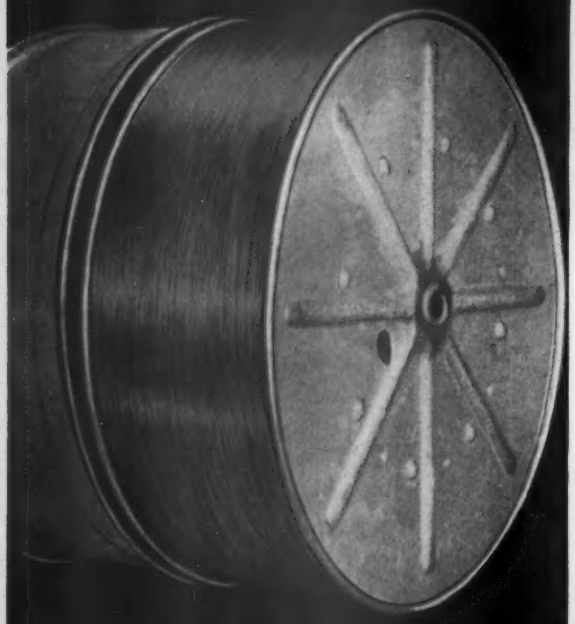

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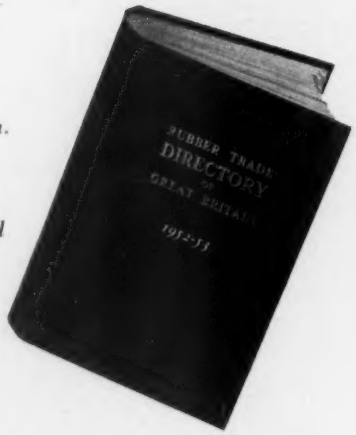

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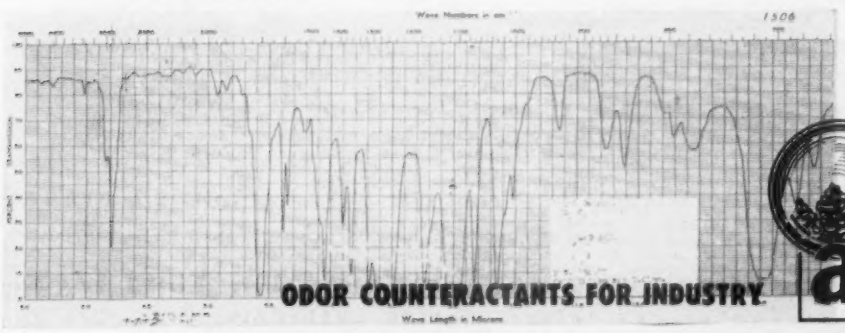

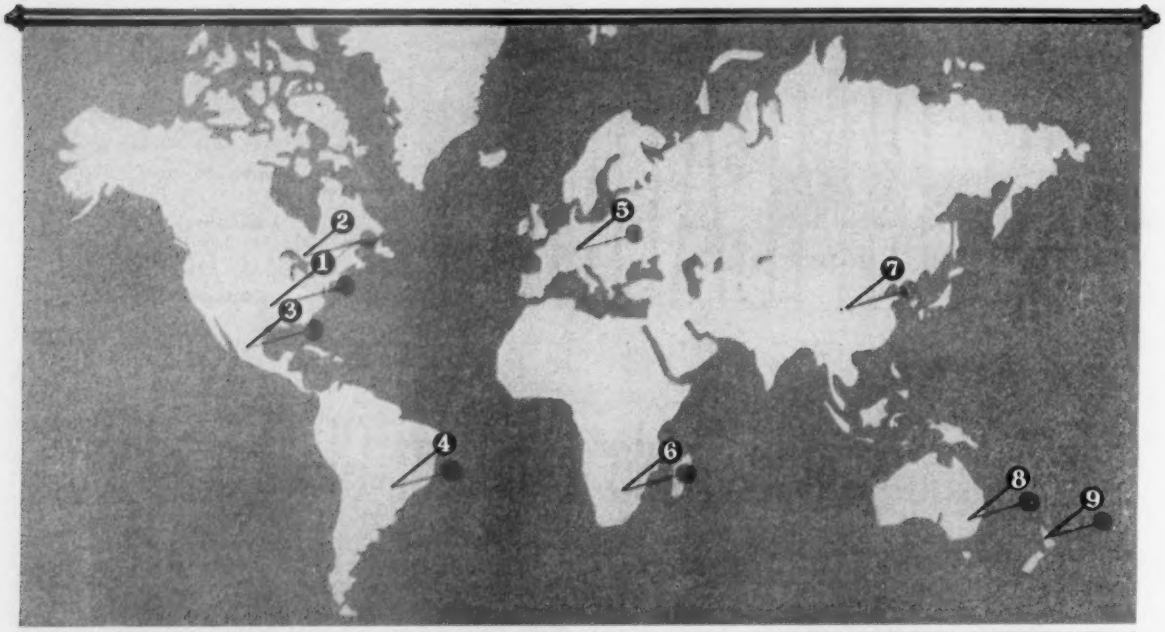

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Determination of Volume Shrinkage in Latex Cast Elastomeric Films

By I. AISENBERG, C. NIELSON, and F. LEONARD

Army Prosthetics Research Laboratory, Walter Reed Army Medical Center, Washington 12, D. C.

A method is presented for the determination of volume changes of synthetic latex films cast in cylindrical gypsum molds. The method involves cutting the cylindrical film along an element of the height, and flattening the cylinder to a plane sheet. The height, length and thickness of the sheet are measured. From these data the volume enclosed by the cylindrical film and the percent shrinkage may be calculated. A nomograph from which the percent shrinkage may be obtained directly is presented.

DURING the course of an investigation of the application of latex-dispersed copolymers of butylacrylate and acrylonitrile to the fabrication of cosmetic gloves for amputees, it became desirable to study the effect of process variables such as drying and curing times and temperatures on the volume shrinkage of slush cast films in cylindrical gypsum molds. To carry out this study it was necessary to devise a method for determining volume shrinkage that was precise and rapid.

The determination of volume of the dried and cured film in this instance was complicated by the inherent softness and extensibility of the copolymer films formed as a result of the slush-casting procedure. A procedure such as filling the hollow cylindrical film with a known volume of water or other liquid resulted in distortion and extension of shape, and procedures in which attempts were made to support the cylindrical film by immersion in a liquid of the same density as the liquid used to fill the form, required too careful manipulative techniques and gave questionable results.

A method was finally devised in which it was necessary only to measure the length, width and thickness of a flat sheet obtained by cutting the hollow cylindrical film. From these measurements the volume occupied by the cylindrical film and the percent shrinkage could be calculated. In order to simplify the calculations, a nomograph was devised and is herein presented.

TABLE I—UNIFORMITY OF MOLDS

Mold	Height of Water (in.)	Volume of Water (c.c.)	Diameter (in.)
E	6.00	610	2.81
F	8.08	830	2.82
G	7.41	750	2.81
H	5.91	610	2.83
I	7.78	803	2.83
J	7.53	777	2.83
K	7.63	791	2.84
L	7.58	779	2.83
M	7.34	759	2.83
N	7.31	759	2.84
O	7.27	750	2.83
P	6.81	695	2.82
Average	—	—	2.83

Average volume for a 6-in. height, 37.67 in.³

Experimental Procedure

Mold Preparation: The molds were prepared over a flexible foamed plasticized polyvinylchloride cylinder supported on a ringstand with the shaft of the ringstand passing through approximately ¾ of the height of the cylindrical core, parallel to the height. The foamed polyvinylchloride cylinder served as a core. The Hydrocal (U.S. Gypsum Co.) (300 g.) was thoroughly mixed with water (150 g.) until no lumps were visible and the mixture was deaerated in vacuo. The Hydrocal slurry was then poured over the cylindrical core until the polyvinylchloride cylinder was completely covered with a thin layer of Hydrocal. During this procedure the core was shaken up and down along the shaft of the ringstand to make certain of complete coverage with no excessive build-up of the Hydrocal. This base layer of Hydrocal was then allowed to harden.

A second slurry of Hydrocal consisting of Hydrocal (300 g.) and water (200 g.) was mixed with stirring. The base layer was moistened and built up with gauze saturated with the second slurry. Two pieces of gauze were crossed for top support and four layers of gauze for side-wall support. This second layer was allowed to harden, and the flexible cylindrical core was removed. The ragged edge at the mouth of the cylinder was squared with a saw. The molds were scratched along their height (on the inner surface) with two parallel marks exactly 6 inches apart.

Casting the Film: The latex material used in these experiments consisted of a dispersion of 90/10 butylacrylate-acrylonitrile (100 parts), polyethylmethacrylate (30 parts), and Syton-C (Monsanto Chemical Co.) (6.5 parts) in Santomerse D. The pH was 8.5; the total solids, about 50 percent.

To cast a film, this latex was poured into the cylindrical molds, allowed to stand at room temperature for 1 hour, and excess latex was poured out. This procedure usually resulted in a film approximately 0.040-inch in thickness. The mold was inverted to allow excess latex to completely drain and the cast film dried at room temperature for 1 hour and then at 60°C. for 4.5 hours. The cylindrical elastomeric film was removed from the mold, slit carefully down one side, the bottom cut away, and finally flattened out to a sheet.

Determination of Average Volume of Molds

The internal volume of the molds was determined by filling them to definite heights with water and measuring the volume of water utilized. The data are shown in Table I and indicate the uniformity of the molds. The range of diameters varied from 2.81 inches to 2.84 inches, with an average diameter of 2.83 inches. The average volume for a 6-inch height was 37.67 cubic inches.

Calculations: When the cast film was removed from the mold, it was cut along a line parallel to the axis of the cylinder through the reproduced scratch marks and then along the base. The cut film was then flattened to a plane sheet. Considering now the distance between the two reproduced scratch marks as the height (h), the distance across the flat film perpendicular to the height as the length (L), and the actual average thickness (t), the percent volume shrinkage (S) can be calculated, viz.:

$$(1) \qquad S = 100\left(\frac{V_c - V_e}{V_c}\right) = 100\left(1 - \frac{V_e}{V_c}\right)$$

$$(2) \qquad V_c = \pi r_c^2 h_c,$$

where V_c = Internal volume of cylindrical Hydrocal mold = 37.67 in.³;
V_e = External volume of cast cylindrical film;
r_c = Internal radius of cylindrical Hydrocal mold, and
h_c = Height between scratch marks = 6 inches.

The cylindrical film as cast is of finite thickness, and the outer and inner circumferences differ. On cutting and flattening the cylindrical film, there is an increase in length of the inner circumference due to tension and a decrease in length of the outer circumference due to compression. Because of the low modulus of elasticity of the cast films, both these dimensions become essentially equal in length after flattening, and the value "L" represents the average circumference. The volume of elastomeric material in the film (V_f) is as follows:

$$(3) \qquad V_f = \pi h(R^2 - r^2) = Lht,$$

where R = External radius of the cast film, and
r = Internal radius of the cast film.

However,

$$(4) \qquad t = R - r.$$

Then

$$(5) \qquad V_f = \pi\, h(R + r)\ (R - r) = Lht$$

$$(6) \qquad L/\pi = (R + r)$$

$$(7) \qquad D = 2\,R = R + (r + t) = (L/\pi) + t,$$

where D = External diameter of cast film.

$$(8) \qquad V_e = \frac{\pi}{4} D^2 h$$

$$(9) \qquad V_e = \frac{h(L + \pi\, t)^2}{4\,\pi}$$

TABLE II—ACCURACY OF NOMOGRAPH

Height (in.)	Thickness (in.)	Length (in.)	Diameter (in.)	% Shrinkage Nomograph	% Shrinkage Calculated
5.00	0.002	7 51/64	2.50	34.8	34.8
5.25	0.003	8 5/64	2.60	25.9	26.0
5.50	0.004	8 23/64	2.70	16.2	16.4
5.75	0.005	8 41/64	2.80	6.0	6.0

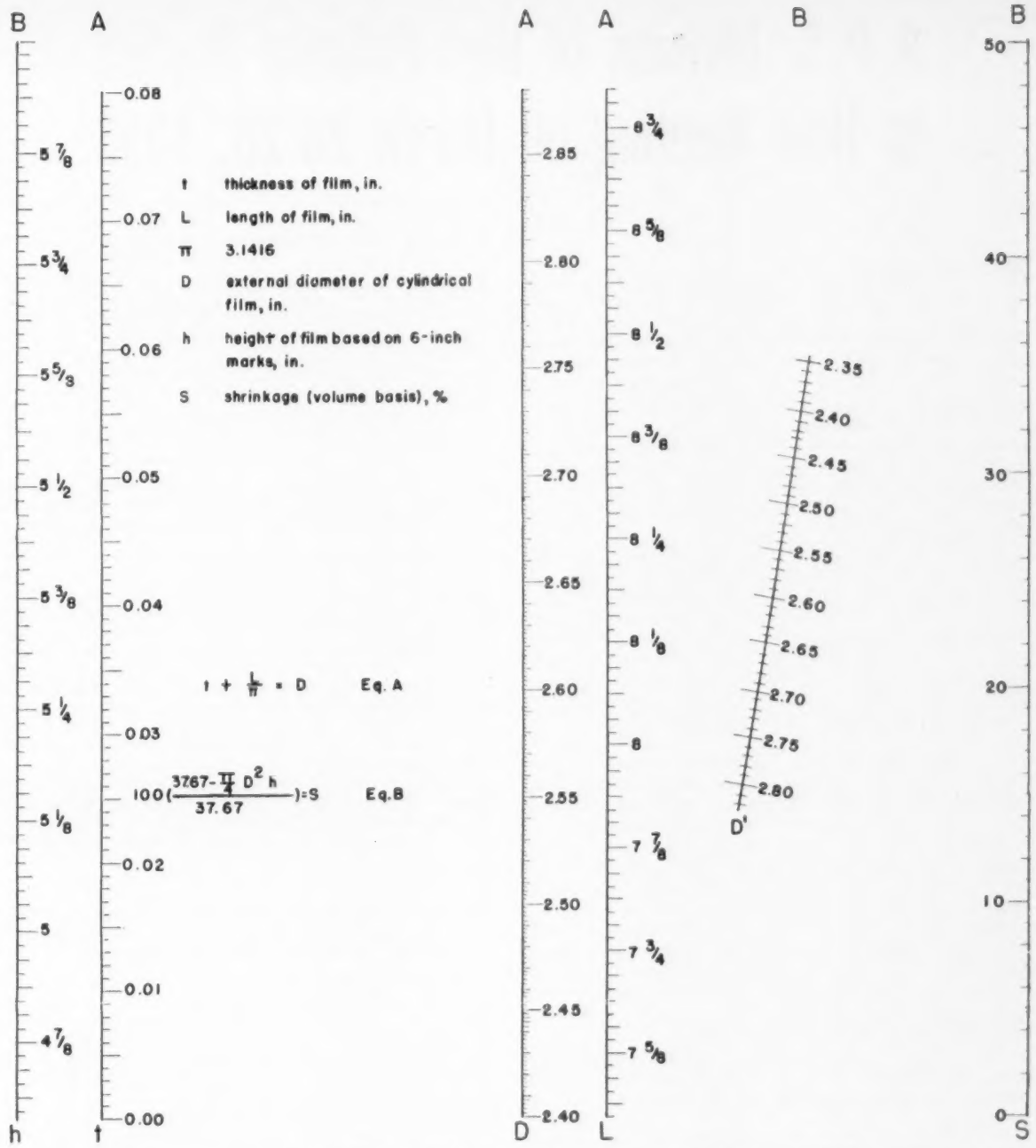


FIG. 1—Determination of volumetric shrinkage of acrylate films cast in stone cylinders by nomograph.

$$S = 100\left[1 - \frac{h(L + \pi t)^2}{4\pi\,(37.67)}\right] \qquad (10)$$

Utilizing equations 7 and 9, a nomograph was constructed in which the percent shrinkage could be directly read. The nomograph is shown in Figure 1, and it is utilized in the conventional manner. For example, to obtain the diameter from a measured thickness and length on a flat sheet, place a straight edge on the measured value on the "t" scale and draw a line to the measured value on the "L" scale. The intersection of this line with the "D" scale gives the desired diameter. This diameter is located on the "D'" scale and connected to the measured height on the "h" scale. This line is extended to intersect the "S" scale from which the percent shrinkage can be read directly. Table II shows examples of the agreement obtained between the calculated values and those obtained through use of the nomograph.

Summary

A method is described for determining the volume changes of an elastomeric latex cast cylindrical film from measurements of the length, height and thickness of a flat sheet cut from the cylindrical film. A nomograph is presented for simplifying the calculations.

A. P. S. Division of High-Polymer Physics to Hold Meeting on March 26-28, 1953

THE Eleventh Meeting of the Division of High-Polymer Physics of the American Physical Society will be held at Durham and Chapel Hill, North Carolina, on Thursday to Saturday, March 26 to 28, jointly with a meeting of the parent society. The program will include the presentation of 16 contributed papers and 10 invited papers. A highlite of the meeting will by a Symposium on Crystallization in Polymers in which well-known American and British polymer physicists will participate. The symposium, which was arranged by a special committee headed by Robert S. Marvin of the National Bureau of Standards, will include both contributed and invited papers.

Among the invited papers to be presented at the symposium are the following: "Equilibrium Theory of Crystallization," by Paul J. Flory, Cornell University, Ithaca, N. Y.; "Kinetics of Crystallization," by Leo Mandelkern, National Bureau of Standards, Washington, D.C.; "Recent Work on the Structures of Crystalline Polymers," by C. W. Bunn, Imperial Chemical Industries, Ltd., London, England; "X-Ray and Infrared Studies on the Extent of Crystallization," by J. B. Nichols, DuPont Experimental Station, Wilmington, Del.; "Relations Between Crystallization and Second Order Transition," by R. F. Boyer, Dow Chemical Co., Midland, Mich., and "Molecular Structure and the Crystallizability of Polymers," by C. W. Bunn.

Additional invited papers scheduled for presentation include: "The Reinforcement of Silicone Rubber," by A. M. Bueche, General Electric Research Laboratory, Schenectady, N. Y.; "Relaxation Distribution Functions of Polymers and Their Concentrated Solutions and Gels," by John D. Ferry, University of Wisconsin, Racine, Wisc., and "Statistical Mechanics of Polymer Chains in Solution" by Bruno H. Zimm, General Electric Research Laboratory, Schenectady, N. Y. Abstracts of the invited papers are not currently available.

Abstracts of the 16 contributed papers scheduled for presentation at the meeting, together with their authors and their company connections, follow herewith:

ABSTRACTS OF PAPERS

Sedimentation Rates in Dilute and Moderately Concentrated Polymer Solutions. ***M. Wales (National Bureau of Standards, Washington, D. C.).***

This work is the initial step in an effort to correlate sedimentation rates of chain polymers on a general basis as a function of concentration, solvent, and molecular weight. It is hoped that the conclusions so obtained can be used to deduce information about chain configuration in concentrated solutions.

Darcy constants [Signer and Egli, *Rec. Trav. Chim.*, Vol. 64, p. 45 (1950)] of polystyrene solutions up to 10% by weight have been obtained as a function of concentration for polystyrene fractions in butanone and toluene. Empirical equations, which represent the sedimentation behavior over the whole range studied, have been devised.

The constant K_s, which describes the dependence of sedimentation constant on concentration in dilute solutions, has been found to be 1.7 times the intrinsic viscosity. This relationship is valid with good precision for polystyrene in chloroform, butanone and toluene, for polyisobutylene in cyclohexane, and for polymethylmethacrylate in acetone. These systems comprise all the data examined, from the literature, and from this work. This proportionality was first noticed experimentally for polystyrene in a number of solvents by Newman and Eirich [*J. Colloid Sci.*, Vol. 5, p. 541 (1950)]. It is more generally valid than was originally supposed.

Nucleoprotein Monolayers. ***Adolph B. Amster (National Bureau of Standards, Washington, D. C.) and Quentin Van Winkle (Ohio State University, Columbus, Ohio).***

A sensitive Wilhelmy apparatus for the study of nucleoprotein monolayers has been constructed. Film pressures may be read to 0.12 dynes/cm. and estimated to 0.003 dynes/cm. It was found that rabbit appendix nucleoprotein spread as a gaseous film upon aqueous substrates of pH 5 to 9 and ionic strength 0.14 and 1.00. The extent of spreading and the number-average molecular weight were found to be a function of the mass of material spread. From these results it was found that the cross-section per molecule was 4.4×10^4 sq. A. The molecular weight varied from 2.66×10^6 at an initial spreading concentration of 4.27 mg./meter^2 to 0.24×10^6 at an initial spreading concentration of 0.458 mg./meter^2.

Certain apparent anomalies in the low pressure region are explained. An hypothesis is offered to explain the variations of molecular weight with spreading concentration, coupled with the invariant cross-section. The nucleoprotein dissociates and unfolds in a manner dependent upon the surface concentration. This process appears to be irreversible and unchanging.

The Dependence of the Photo-Elastic Properties of GR-S on the Degree of Cross-Linking. ***G. R. Taylor and S. R. Darin (Mellon Institute, Pittsburgh, Penna.).***

The birefringence versus stress relationship for decamethylene dis-methylazodicarboxylate vulcanizates of GR-S has been determined as a function of the degree of cross-linking. The experimental results show a systematic deviation from Brewster's law (stress proportional to birefrigence) at stresses greater than 30 kg/cm^2, the deviations becoming more pronounced as the degree of cross-linking is decreased.

While most of the measurements were taken during stress relaxation, in the cases where it was possible to obtain approximately equilibrium conditions it was found that the stress-birefringence ratio was essentially independent of the state of relaxation of the material, i.e., relaxation occurs along the equilibrium stress-birefringence curve.

In the light of these results, the applicability of W. Kuhn's [Kuhn and Grün, *J. Polymer Sci.*, Vol. 1, p. 185 (1946)] expression for birefringence/stress is discussed, and reasons for its failure in light vulcanizates are suggested.

(NOTE: The work reported in this paper was performed as a part of the research project sponsored by the Office of Synthetic Rubber, Reconstruction Finance Corporation, in connection with the government synthetic rubber program).

Stress Crazing Threshold of Methyl Methacrylate Polymers. ***T. F. Protzman, J. J. Gouza and W. F. Bartoe (Physics Laboratory, Rohm & Haas Co., Philadelphia, Penna.).***

Time-deformation studies have been made on stressed cantilever beams of polymethyl methacrylate. The first incidence

of crazing on each beam was observed. From the deformation a measure of the strain in the outer fibers of the cantilever beam is calculated at the time of incidence of crazing. It is found that the crazing threshold strain is a linear function of the applied stress. This contrasts with the results obtained by Maxwell and Rahm (Princeton University, Plastics Laboratory Technical Report 11B, Sept. 21, 1948), who found that polystyrene crazes at a fixed strain. The results of these measurements are interpreted qualitatively on a basis of polymer rheology.

Rheology of Polyisobutylene. III. Approximation Methods in Linear Viscoelasticity Theory: Wiechert Function Calculations. ***Herbert Leaderman (National Bureau of Standards, Washington, D. C.).***

In connection with previously reported retarded elastic behavior of low molecular weight polyisobutylene [Leaderman and Smith, *Phys. Rev.*, Vol. 81, p. 303 (1951)], a study has been made of the validity of approximation methods in the calculation of the retardation time function $L(\ln\tau/\tau_0)$ and of dynamic response from creep data obtained from a Wiechert "model" retardation time function with $b = 0.4$. First and second approximations for $L(\ln\tau/\tau_0)$ are calculated by the methods of Alfrey and Schwarzl [Schwarzl and Staverman, *Physica*, Vol. 18, p. 791 (1952)]. Second approximations are also obtained by differentiating $J'(\omega\tau_0)$ calculated by Marvin's difference function [Marvin, *Phys. Rev.*, Vol. 86, p. 644 (1952)] and by a new successive approximation method. Alfrey's method and Schwarzl's approximations were obtained also by fitting retarded elasticity data (from the "model" function) to a Kohlrausch type function.

Marvin's difference function method appears to be the best way of computing $J'(\omega\tau_0)$ from creep data. $J''(\omega\tau_0)$ has been computed from $J'(\omega\tau_0)$ (a) by an approximate method using a difference function and (b) exactly by a Kronig-Kramers integral.

(NOTE: The work reported on in this paper was supported by the Office of Naval Research and the Office of the Quartermaster General).

Dynamic Mechanical Properties of Polyisobutylene. ***Edwin R. Fitzgerald (Department of Physics, Pennsylvania State College), Lester D. Grandine, Jr. (E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.), and John D. Ferry (University of Wisconsin, Madison, Wisc.).***

Values of complex sheer compliance (and rigidity) have been obtained for a sample of polyisobutylene of viscosity-average molecular weight 1.35×10^6 (distributed by the National Bureau of Standards) at 22 temperatures from -45 to $100°$ C. and at about 20 frequencies from 30 to 5000 cps. Measurements were made by means of the transducer method of Fitzgerald and Ferry with a precision of $\pm 2\%$ and are estimated to be accurate to within $\pm 3\%$ as evidenced by agreement obtained between 7 different samples of widely varying dimensions.

Values of the real part of the complex shear compliance J', vary from 1.1×10^{-5} cm²/dyne at 99.9° C. to 1.0×10^{-10} cm²/dyne at $-44.6°$ C. The frequency dependence of the loss tangent J''/J' indicates the presence of a low, broad maximum of 1.7 at -10 to $-5°$ C. and a second, smaller maximum or plateau at lower temperatures. This second maximum is also evident in a plot of J''/J' at a fixed frequency against temperature. The wide temperature and frequency ranges of the measurements have provided an essentially complete experimental description of the dispersion region in polyisobutylene corresponding to the transition from a rubberlike elasticity to that of a hard glass.

The Relaxation Distribution Function of Polyisobutylene in the Transition from Rubberlike to Glasslike Behavior and its Dependence on Temperature. ***John D. Ferry (University of Wisconsin, Madison Wisc.), Lester D. Grandine, Jr. (E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.), and Edwin R. Fitzgerald (Department of Physics, Pennsylvania State College, State College, Penna.).***

The steady flow viscosity of a sample of polyisobutylene of viscosity-average molecular weight 1.35×10^6 (distributed by the National Bureau of Standards) has been measured from 15° to 97° C; its logarithm is a linear function of $1/T°$. The complex compliance of this material, $J' - i J''$, as reported previously from $-45°$ to 100° and from 30 to 5000 cps, has been analyzed by the method of reduced variables modified (Fitzgerald and Ferry, *J. Colloid Sci.*, in press) to account for the glasslike compliance; it yields single composite curves for J' and J''. The values of a_T, the temperature reduction factor, are slightly but significantly larger than those derived directly from the viscosity; the latter, however, agree with those derived from stress relaxation measurements of Tobolsky and McLoughlin [*J. Polymer Sci.*, Vol. 8, p. 543 (1952)]. The reduced loss tangent, J''_R/J'_R, as a function of reduced frequency is broader than in other polymers and shows the secondary plateau apparent in the original data. The distribution functions of relaxation and retardation times are similar in shape to those of other polymers in the transition from rubberlike to glasslike behavior.

Dynamic Properties of Unvulcanized GR-S. ***L. J. Zapas, S. L. Shufler and T. W. DeWitt (Mellon Institute, Pittsburgh, Penna.).***

Dynamic moduli and loss factors have been measured on a sample of unvulcanized GR-S at temperatures between $-68°$ C. and $+63°$ C. The frequencies employed ranged from about 5×10^{-4} cps to 3 cps. This range of frequencies and temperature was sufficient to include nearly the whole of the glassy transition region where the shear modulus drops abruptly from about 1×10^{10} dynes/cm² to about 1×10^{7} dynes/cm² where there is a suggestion of a plateau. At higher temperatures, the modulus drops off gradually and continuously, presumably to zero. The lowest measured value was about 3×10^{5} dynes/cm². When plotted in terms of reduced variables, the data cover a considerable section of the useful mechanical frequency spectra for this sample of GR-S. The data are compared with stress relaxation measurements reported in the literature.

(NOTE: The work reported on in this paper was performed as a part of the research project sponsored by the Office of Synthetic Rubber, Reconstruction Finance Corporation, in connection with the government synthetic rubber program).

Dynamic Properties of Concentrated Polymer Solutions. ***F. J. Padden, H. Markovitz and T. E. DeWitt (Mellon Institute, Pittsburgh, Penna.).***

The dynamic rigidities and viscosities of a variety of solutions of polyisobutylene in decalin have been determined in the neighborhood of room temperature and at frequencies between 10 and 100 cycles per second. Zero shear viscosities of these solutions have been measured by both falling ball and capillary methods. Concentration and molecular weight of the solute were the main variable and ranged from a 5% solution of a sample of molecular weight 2.5×10^{6} to a 40% solution of a sample of molecular weight 1.5×10^{6}.

When reduced variables that take into account concentration and temperature are used, superposition of data from samples of different molecular weights is not achieved. A scale shift that is equivalent to treating molecular weight semi-quantitatively as an inverse concentration achieves reasonable superposition and suggests that the important variable is the number of chains per unit volume. The results are compared with some previously obtained on low molecular weight oils and on whole polymer.

(NOTE: The work reported on in this paper was performed as a part of the research project sponsored by the Office of Synthetic Rubber, Reconstruction Finance Corporation, in connection with the government synthetic rubber program).

Calculation of Extrusion Behavior of Viscoelastic Materials from the Relaxation Distribution Function. ***Thor L. Smith (Hercules Powder Co., Wilmington, Del.).***

A viscoelastic material when extruded rapidly through a short capillary or spinneret may exhibit an effective viscosity which is smaller by a factor of several hundred than the viscosity as usually measured at low shear rates. An equation is derived which expresses the effective viscosity as a function of the time the material spends in the spinneret (transit time) and the distribution function of Maxwellian relaxation times. In the deri-

vation it is assumed that the mechanical properties of the material may be represented by a generalized Maxwell model.

Effective viscosities observed when a 25% cellulose acetate solution is extruded through a spinneret with radius 0.006 cm. and effective length 0.0186 cm. are given. The relaxation distribution function for the solution is calculated from the published dynamic viscosity data of Philippoff. From the distribution function and values of the transit time, effective viscosities are calculated and found to agree with the experimental values to within factors of 1.2 to 3.1. This agreement is considered satisfactory in view of the fact that all non-linear effects (non-Newtonian and non-Hookean) are neglected in the calculations and the effective viscosities are smaller than the usual flow viscosity by factors of 150 to 10.

Dielectric Relaxation in a Styrene-Acrylonitrile Copolymer During and After Its Polymerization. ***P. Ehrlich and N. J. DeLollis (National Bureau of Standards, Washington, D. C.).***

Dielectric relaxation in a plasticized copolymer of styrene and acrylonitrile during its polymerization and in the fully polymerized resin is studied by means of measurements of dielectric constant and loss tangent at frequencies from 10^2 to 10^6 cps. Drastic changes in dielectric constant and loss occur during the polymerization. These are interpreted as resulting from the relaxation of the nitrile groups at a rate which depends strongly on the extent of the polymerization. There is a striking parallelism between the electrical properties of the fully polymerized copolymer as observed at elevated temperatures and those of the partly polymerized reaction system at an early stage of the reaction and at a lower temperature; values of the loss factor are similar at equal average relaxation times and in each case there is a similar broadening of the relaxation distribution function as cross-links are introduced. Values of the heats and entropies of activation are consistent with the picture of dipole relaxation.

Dielectric Dispersion of Polar Polymers at Microwave Frequencies. ***T. M. Shaw and J. J. Windle (Western Regional Research Laboratory, U. S. Department of Agriculture, Albany, Calif.).***

The dielectric properties of wool and mohair have been investigated at frequencies of 3,000 Mc and 10,000 Mc by means of a cavity resonator method. The resonator previously described [Shaw and Windle, *J. Appl. Phys.*, Vol. 21, p. 956 (1950)] was provided with a slot parallel to the direction of current flow in the cavity, which allows the use of taut fiber specimens. Fibers are mounted on a frame which, when inserted in the slot in the cavity, positions the fibers precisely on the cavity axis. It was found that the dielectric constant, ϵ, at 25° C., of oven-dry wool is the same, within experimental error, as that of oven-dry mohair. For wool $\epsilon = 3.70 \pm 0.04$ at 3,000 Mc and 3.54 ± 0.04 at 10,000 Mc. These values are significantly smaller than the value $\epsilon = 4.2 \pm 2\%$ reported by Errera and Sack [*Ind. Eng. Chem.*, Vol. 35, p. 712 (1943)] for lower frequencies and are large compared to the square of the index of refraction for visible light, $n^2 \sim 2.4$. In a survey of the dielectric properties of other hydrogen-bonded polymers, large differences between the dielectric constant for frequencies in the microwave range and n^2 were also found.

Orientation in Polymeric Films by Infrared and X-Ray Techniques. ***W. H. Cobbs, Jr., S. B. Cole and R. L. Burton (Duke University, Durham, N. C.).***

Methods have been evolved for quantitative estimation of degree of orientation of polymeric films by a Weissenberg X-ray technique and by absorption of polarized infrared light. Both axial orientation and uniplanar orientation may be determined in each method. The results from the X-ray method apply only to the crystalline part of the polymer, whereas those from infrared include in addition to a crystalline part a contribution from the amorphous regions. Results from both methods are in general agreement; in certain cases differences can be interpreted in terms of the relative importance of the crystalline and amorphous portions in oriented polymeric materials.

Crystallization in Butadiene-Styrene Copolymers. ***Lawrence A. Wood (National Bureau of Standards, Washington, D. C.).***

Butadiene-styrene copolymers contain the following units: *trans*-1,4-polybutadiene, *cis*-1,4-polybutadiene, 1,2-polybutadiene, and polystyrene. Of these, the first is the only type which has been shown by x-ray evidence to form crystals. An examination is made of the consequence of the hypothesis that crystallization in these copolymers in a given time at the optimum temperature requires a certain minimum content of *trans*-1,4 units, independent of the relative amounts of the other three types. Lines of constant *trans*-1,4 content are plotted on a graph with the content of polystyrene units as abscissa and the proportion of *trans*-1,4 units with respect to total polybutadiene content as ordinate.

A similar family of curves can be plotted with the temperature of polymerization as ordinate. According to the hypothesis, one of the curves will mark the boundary between the region of possible crystallization and the region in which crystallization will not be noted in the given time. Dilatometric and calorimetric studies of the crystallization within about 3 hours at —45° C. yield experimental points which conform quite well to the curve for a *trans*-1,4 content of about 58 percent. The fact that the points fall on a single curve appears to give substantial support to the hypothesis.

The Melting Transition of Natural Rubber. ***Donald E. Roberts and Leo Mandelkern (National Bureau of Standards, Washington, D. C.).***

The statistical thermodynamic theory of semicrystalline polymers [Flory, *J. Chem. Physics*, Vol. 17, p. 223 (1949)] has led to the concept of an equilibrium melting temperature, T_m, the temperature at which crystallinity disappears completely. This temperature is characteristic of a given polymer and independent of previous thermal history. The well-known results for natural rubber where the melting temperature is strongly dependent on the crystallization temperature [Wood and Bekkedahl, *J. App. Physics*, Vol. 17, p. 362 (1946) and *J. Res. Nat. Bur. Standards*, Vol. 36, p. 489 (1946)] are not in accord with these conclusions, and have been reinvestigated.

The melting temperatures of two molecular weight fractions and a third sample of purified rubber hydrocarbon were determined, as a function of crystallization temperature, using dilatometric techniques. After crystallization at —18° C., 0° C., and +8° C., on subsequent slow heating the melting temperatures all occurred in the range 22° to 23° C., irrespective of the crystallization temperature. A slow heating rate is important in order to allow imperfect crystallites to reform into a more stable arrangement; if a fast heating rate is employed, results similar to those previously reported by Wood and Bekkedahl are obtained. However, after crystallizing at +14° C. and heating slowly, the melting temperatures occur in the range 27° to 28° C. Thus, the effect of the crystallization temperature on the melting temperature is considerably smaller in magnitude than previously thought.

An Infra-Red Study of the Crystallization of Polyethylene. ***Alexander Brown and F. P. Reding (Carbide and Carbon Chemicals Co., New York, N. Y.).***

The melting points and the temperatures for the onset of crystallization of a series of polyethylene resins covering a variety of molecular weights and degrees of chain branching have been determined by observing the 13.7 micron crystallinity band of the infrared spectrum. An increase in the amount of chain branching decreases the melting point considerably whereas a decrease in the molecular weight, at least in the range studied, lowers the melting point only slightly. On the other hand, an increase in chain branching decreases, but a decrease in molecular weight apparently increases the temperature at which crystallization starts at any given rate of cooling. The rate of crystallization of polyethylene as a function of temperature, chain branching and molecular weight will also be discussed. In the temperature range studied the rate increases markedly with a decrease in temperature and a decrease in the amount of chain branching.

The Use of Hi-Sil in Natural Rubber White Sidewall Compounds

By RALPH F. WOLF, F. W. GAGE, and C. C. STUEBER

Research Laboratory, Columbia-Southern Chemical Corporation, Barberton, Ohio.

THE possibility of replacing zinc oxide with a lower cost and better reinforcing pigment, such as Hi-Sil, in white sidewall and other highly loaded zinc oxide compounds is one that occurs naturally to many rubber compounders. The advantages obtainable from such a substitution are both obvious and attractive.

One of the most obvious advantages is, of course, the much lower volume cost made possible through use of Hi-Sil. The silicon dioxide pigment has a specific gravity of only 1.95 compared with 5.57 for zinc oxide. Pound cost of Hi-Sil is about two-thirds that of zinc oxide and, consequently, its pound-volume cost is only one-fifth to one-fourth that of the older material. More important than lower cost in a tire application is the fact that the Hi-Sil compound is also of higher quality. Replacing the zinc oxide with Hi-Sil results in increased resistance to tearing, snagging and curb scuffing.

Processing Advantages Offered

The higher quality and lower cost of the Hi-Sil stock are not achieved at the expense of processability. Instead, the Hi-Sil stock offers processing advantages which result in intangible, but real, savings. For example, it is easier to build tires with Hi-Sil loaded white sidewall compounds because highly loaded zinc oxide stocks containing no Hi-Sil are soft and sidewalls extruded from them are easily deformed in storage and handling. Tires having Hi-Sil loaded white sidewalls come out of the molds with fewer light spots. Zinc oxide compounds, being softer, flow too readily and trap air between the uncured tire and the mold, causing light spots in the sidewall. The stiffer Hi-Sil loaded white sidewall also reduces the number of cured tires that have torn spots at the vents. The softer zinc oxide stock flows into the mold vents and this portion tears off when the cured tire is removed from the mold. Hi-Sil stocks, being stiffer and having better hot tear, prevent such blemishes. This also cuts down on the amount of mold time lost while vents are cleaned.

Even after tires are cured, those having Hi-Sil loaded white sidewalls are easier to handle in the finishing operation. A highly loaded zinc oxide stock, containing no Hi-Sil, is soft and has low modulus; consequently, the stock stretches with the buffer instead of resisting it. Hi-Sil stocks are easier to buff and brands or size marks have sharp, distinct edges after buffing.

In some of the early work on use of Hi-Sil in natural rubber white sidewalls, direct volume for volume replacement of all but the activation zinc oxide in existing compounds was attempted. These attempts were not successful. The refractive index of Hi-Sil is 1.44, close to that of rubber. As a consequence of this and of its fine particle size, Hi-Sil has little covering power compared to zinc oxide. Even though established white sidewall compounds contain considerable quantities of titanium dioxide, the replacement of most of the zinc oxide resulted in a definite loss of whiteness.

The established natural rubber compound in which the early work was done contained 14 PHR of TiO_2 and 87 PHR of ZnO. Replacing 82 PHR of the latter with 26.7 PHR of Hi-Sil and increasing the TiO_2 from 14 to 25 PHR gave a compound that was nearly as white as the control originally but which discolored more rapidly under a sunlamp or in sunlight. The amber color developed by natural rubber exposed to ultra-violet rays was too pronounced to be obscured by the TiO_2 alone.

Two lines of approach were then followed. In one case, work was directed toward determining the maximum amount of zinc oxide that could be replaced in the control compound without having its whiteness decrease after sunlamp or sunlight exposure. In the other case, the work was directed toward developing an entirely new compound in which all of the zinc oxide, except that needed for activation, would be replaced without sacrifice of whiteness after exposure.

In both cases the desired results were achieved. It was found that slightly more than half of the zinc oxide in a commercially used white sidewall compound could be replaced by Hi-Sil on a volume basis without adverse effect. It was also found that all but the activation zinc oxide could be replaced with Hi-Sil and the color after exposure actually improved over that of the control. This was accomplished by a change in acceleration and addition of a material—diethylene glycol—which served as a discoloration depressant or anti-discoloration agent. The recipes recommended for partial and for complete replacement of zinc oxide together with the control compound are listed in Table I and stocks made from them are illustrated in Fig. 1. It should be understood that where the term "complete replacement" is used throughout this paper it refers to replacement of all zinc oxide except for 10 PHR retained for activation.

Pound Versus Volume Costs

In examining Table I it will be noted that the pound cost of the stocks in which zinc oxide is replaced is higher than that of the highly loaded zinc oxide control. However, the specific gravity of the latter is 1.545 compared to 1.342 for the compound in which zinc oxide is partly replaced and only 1.222 for the compound in which all but activation zinc oxide is replaced. Consequently, the volume costs of the compounds containing less zinc oxide are much lower than that of the control. Where all but the activation zinc oxide is replaced, the saving amounts to $0.06 a pound volume, a reduction of nearly 15 percent below the volume cost of the control.

The ability of diethylene glycol to inhibit the sun-

TABLE I—RECOMMENDED RECIPES FOR PARTIAL AND COMPLETE REPLACEMENT OF ZINC OXIDE IN WHITE SIDEWALL COMPOUNDS

A Control		B Partial Replacement of ZnO With Hi-Sil		C Replacement of All But Activation ZnO with Hi-Sil	
Pale Crepe	100.0	Pale Crepe	100.0	Pale Crepe	100.0
Zinc Oxide (XX72)	87.0	Zinc Oxide	40.0	Zinc Oxide	10.0
Titanox A-MO	14.0	Hi-Sil	16.5	Hi-Sil	27.1
Ultramarine	0.2	Titanox A-MO	20.7	Titanox A-MO	25.0
Hepteen Base	0.23	Ultramarine	0.2	Ultramarine	0.2
Sulfur	2.9	MBTS	0.4	MBTS	0.4
Sunproof Wax	3.0	DPG	0.35	DPG	0.35
		Sulfur	2.9	Sulfur	2.9
		Stearic Acid	2.0	Stearic Acid	2.0
		Sunproof Wax	3.0	Diethylene Glycol	2.0
				Sunproof Wax	3.0
Sp. Gr.	1.545	1.342		1.222	
Lb. Cost*	$0.2729	0.2853		0.2959	
Lb. Vol. Cost*	$0.4216	0.3828		0.3616	
Color:					
Sunlamp, 120 hours:		Equal to control		Better than control	
Outdoor Exposure, 7 weeks:		Equal to control		Better than control	

Compound	Mins. Cure at 280° F.	Mod. (300%)	Tens.	Elong.	Duro. Hard.	Tear (lbs./in.)	DeMattia Flex (90,000 Flexes)
A—Control	10	270	2660	735	38	160	—
	20	400	3375	710	42	285	—
	30	455	3585	695	44	330	.027
	45	515	3565	670	46	330	.020
	60	565	3635	660	48	325	.023
	90	480	3425	660	47	315	—
	120	765	3375	605	52	315	—
B—Partial Replacement of ZnO with Hi-Sil	15	410	3040	660	43	290	—
	20	570	3570	660	45	460	—
	30	700	4070	660	49	480	.027
	45	740	4000	640	52	330	.030
	60	700	3800	630	52	350	.020
	90	740	3570	620	54	360	—
	120	610	3570	620	53	310	—
C—Replacement of all but activation ZnO with Hi-Sil	10	790	3660	630	54	490	.040
	20	1040	3800	600	60	400	.093
	30	940	3500	580	61	410	.137
	45	890	3460	580	61	380	—
	60	910	3220	580	63	350	—
	90	820	3300	600	60	420	—
	120	820	3290	610	60	340	—

* Based on Current Market Price Section in December, 1952, issue of *Rubber Age* (N. Y.). Price used for pale crepe = $0.40 a pound.

lamp and sunlight discoloration of white natural rubber compounds has not been reported previously in the literature to the best of our knowledge. The reason for the reduction in discoloration shown by the glycol compounds is not known at present. Although it can not be explained, the effect is real and apparent and has been demonstrated in other Hi-Sil loaded compounds.

Use of glycol to prevent sunlight discoloration is not limited to silica compounds. It has been demonstrated that highly loaded zinc oxide compounds containing no Hi-Sil suffer less discoloration in sunlight when 2 PHR of diethylene glycol are present. It is believed that this is a new and important development in the compounding of non-black rubber goods and may prove valuable in all types of non-black compounds in addition to those based on Hi-Sil or zinc oxide. The effect of diethylene glycol in admixture with non-staining antioxidants on non-black rubber compounds would be well worthy of study.

Statements made in this paper regarding Hi-Sil compounds equal to or better than zinc oxide compounds in resistance to sunlight discoloration are based on both sunlamp and outdoor exposure tests. In the former test, samples were exposed to a G.E. S-1 Sun Lamp for 120 hours according to the general method described in A.S.T.M. D620-49. Outdoor exposure tests were run on samples elongated 20 percent and in accordance with A.S.T.M. D518-44. Results reported here are based on a minimum of seven weeks summer exposure in the Akron area and are being continued in Texas during the present winter.

Partial Replacement of Zinc Oxide

The high zinc oxide commercial compound shown in Table I as the control is accelerated with 0.23 PHR of Hepteen Base. Such acceleration is, of course, insufficient for a more adsorptive pigment such as Hi-Sil. Therefore, when 77 PHR of the zinc oxide in this compound were replaced with an approximately equal volume of Hi-Sil, it was found necessary to increase the acceleration to 1 PHR of Hepteen Base plus 0.25 PHR of T.M.T.D.S. and to add 2 PHR of stearic acid to ob-

tain a good cure rate. It was also found necessary to increase the titanium dioxide from 14 to 25 PHR to maintain the same whiteness in the compound before sunlight exposure. As mentioned previously, this compound discolored more rapidly than the control after exposure to a sunlamp or to sunlight.

A series of eight compounds was then run in order to learn how much zinc oxide could be replaced by Hi-Sil without encountering excessive discoloration in the exposed samples. Stepwise replacement of the zinc oxide with equal volumes of Hi-Sil was made, the zinc oxide being cut successively from 87 to 70 and then to 60, 50, 40, 30, 20, and 10 PHR. The Hepteen Base, T.M.T.-D.S., and titanium dioxide were adjusted upward in aliquot steps from 0.23 to 1.0, 0 to 0.25 and 14 to 25 PHR, respectively, for each increase in Hi-Sil. The stearic acid was not varied proportionately; two parts were used in all of the Hi-Sil compounds.

The titanium dioxide adjustment used gave compounds of very similar unexposed color for the whole series of zinc oxide-Hi-Sil ratios. However, the color obtained after sunlamp exposure became progressively darker as the zinc oxide was replaced by Hi-Sil. Up to the replacement of slightly over half of the zinc oxide by Hi-Sil the increase in discoloration over the all zinc oxide loaded control was slight and would be passable. When Hi-Sil replaced larger amounts of zinc oxide the severity of discoloration increased rapidly with each decrease of zinc oxide content, and the compounds would be unacceptable for commercial applications.

This series of tests, then, indicated that approximately half of the zinc oxide could be replaced with an equal volume of Hi-Sil without noticeable effect on the color of the stock after sunlamp or sunlight exposure. Beyond this point, the Hi-Sil stock would be darker. A comparison of the physical properties of the two compounds is shown in Table II.

TABLE II—COMPARISON OF PHYSICAL PROPERTIES OF ZINC OXIDE STOCKS WITH AND WITHOUT ADDITION OF HI-SIL

	A High ZnO	D Hi-Sil
Pale Crepe	100.0	100.0
Zinc Oxide	87.0	40.0
Hi-Sil	—	16.5
Titanox A-MO	14.0	20.7
Ultramarine Blue	0.2	0.2
Hepteen Base	0.23	0.87
TMTDS	—	0.21
Sulfur	2.9	2.9
Sunproof Wax	3.0	3.0
Stearic Acid	—	2.0

Compound	Mins. Cure at 280° F.	Mod. (300%)	Tens.	Elong.	Hard.	Tear (lbs./in.)
A—High ZnO	5	130	1310	740	33	50
	10	280	2370	730	36	110
	20	380	3220	730	38	230
	30	400	3570	720	42	250
	60	550	3670	670	48	390
	120	710	3450	630	50	310
D—Hi-Sil	5	870	4170	620	57	330
	10	980	3830	580	57	250
	20	1020	3210	520	58	300
	30	1040	3330	540	60	260
	60	870	3090	530	58	260
	120	770	3130	580	57	260

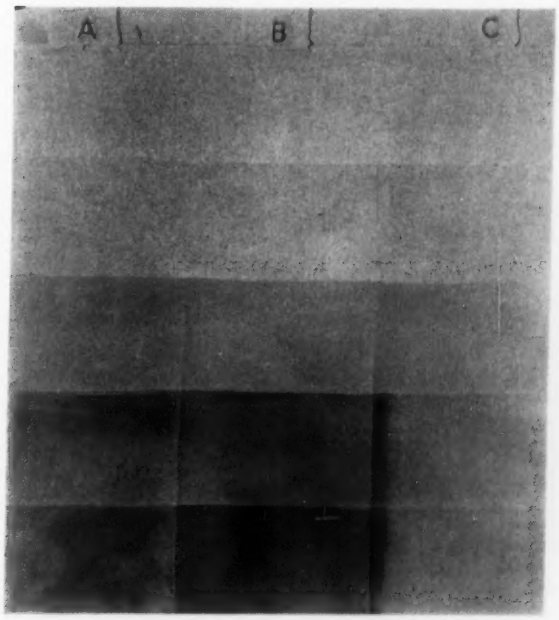


FIG. 1—G.E. S-1 Sun Lamp exposure of compounds made from the recipes listed in Table I.

A is the control compound containing high zinc oxide and no Hi-Sil. In B, approximately half of the zinc oxide has been replaced with an equal volume of Hi-Sil. In C, all but the activation zinc oxide has been replaced with Hi-Sil. The top strip had no exposure; strips below it were exposed respectively for 8, 24, 48 and 120 hours.

The rate of cure of compound D containing Hi-Sil and cured with Hepteen Base-TMTDS is faster than is desirable. As thiazole-guanidine combinations are known to be better in this respect *(1)* a test was then run to determine the effect on cure rate and color of substituting this type of acceleration for the Hepteen Base-TMTDS combination. Not only was the curing rate more satisfactory as can be seen by comparing B in Table I with compound D in Table II but the color of the resulting compound was also definitely whiter after sunlight or sunlamp exposure. This may result from the fact that Hepteen Base, although generally considered non-discoloring, is not so when used in the amounts required to cure a Hi-Sil compound.

These, then, were the steps leading to the development of the recipe recommended in Table I for the partial replacement of zinc oxide with Hi-Sil in white sidewall compounds.

Previously, diethylene glycol had proven effective in preventing discoloration of other types of Hi-Sil loaded white compounds. During the course of this work, two parts of glycol were added to recipe D shown in Table II. The resulting compound discolored very much less than either A or D as can be seen in the comparison with D in Fig. 2. The effect was so marked that it was felt that this additive might prove to be the means by which all but the activation zinc oxide could be replaced.

Complete Replacement of Zinc Oxide

It was mentioned above that all but the activation zinc oxide in a commercial white sidewall compound could be replaced by an equal volume of Hi-Sil by changing ac-

FIG. 2—Effect of diethylene glycol in reducing the discoloration of a Hepteen Base-TMTDS cured natural rubber white sidewall compound in which zinc oxide has been partly replaced with Hi-Sil.

Sample 1-A was made using recipe D. Sample 1-B is identical except that it contains 2 PHR of diethylene glycol. Beginning at the top, strips were exposed for 0, 8, 24, 48 and 120 hours to a G.E. S-1 Sun Lamp.

celeration, increasing the titanium dioxide, and adding a material such as diethylene glycol which acts as an anti-discoloration agent. The color of the resulting compound is equal to that of the commercial compound used as control and is superior to it after sunlamp or outdoor exposure. This can be seen by comparing A and C in Figure 1.

The improved physical properties obtained by replacing all but the activation zinc oxide are shown in Table I. Modulus of the Hi-Sil compound at 300 percent elongation generally runs 400 or 500 pounds higher than that of the control. Durometer hardness is increased about 10 points. Tensile strengths are about the same and elongation of the Hi-Sil stock is generally slightly lower. Tear resistance of the Hi-Sil compound is better over the entire range of cures, running 50 to 80 pounds per inch higher in the middle of the range. Resistance of all three of the stocks to flex crack growth was good as measured by the DeMattia Flexer. Although not as good as the control or the partial replacement stock, the high Hi-Sil compound was still quite good.

As mentioned above the reason for the reduction in discoloration resulting from the use of diethylene glycol is not known at the present time. This phenomenon was noticed some time ago when diethylene glycol was added to an air-cured, Hi-Sil loaded sheet stock to increase the rate of cure. The glycol performed this function but it was also noticed that the resulting cured stock had a much whiter color after sunlamp exposure than the control without glycol. At first, it was thought that the glycol was merely blanketing the surface of the Hi-Sil and preventing some reaction with the antioxidant. This point was checked by omitting the antioxidant and running the compound with and without glycol. Again the stock containing glycol was much whiter after sunlamp exposure.

Then it was thought that the glycol might be exerting a blanketing effect which was reducing the available surface area of the pigment. Hi-Sil is a relatively high surface area material and as such might be expected to have a slight catalytic effect on a rubber surface exposed to sunlight. However, as stated earlier, glycol also reduces sunlight discoloration of zinc oxide loaded compounds. Since the latter is a relatively low surface area pigment, some action other than a mere surface blanketing appears to be involved.

Although the reason for the effectiveness of diethylene glycol is not apparent, the effect itself is very pronounced and can be seen easily in Figures 3 and 4. The effect of glycol on Hi-Sil loaded smoked sheet compounds cured both with Hepteen Base-T.M.T.D.S. and with MBTS-DPG combinations is shown in Fig. 3. A similar comparison is shown in Fig. 4 except that pale crepe was used instead of smoked sheets. The sample marked 5B in Fig. 4 is the same as compound C in Fig. 1 and Table I.

A higher molecular weight polyglycol—Carbowax 4000—did not reduce discoloration as diethylene glycol did. Possibly the larger molecule is less able to block the pigment surface and so does not repress whatever action is taking place. At any rate, diethylene glycol is a much more effective anti-discolorant.

Type of Titanium Dioxide

It will be noted that the recommended recipes in Table I show use of Titanox A-MO, an anatase grade.

A comparison was made, early in this work, between

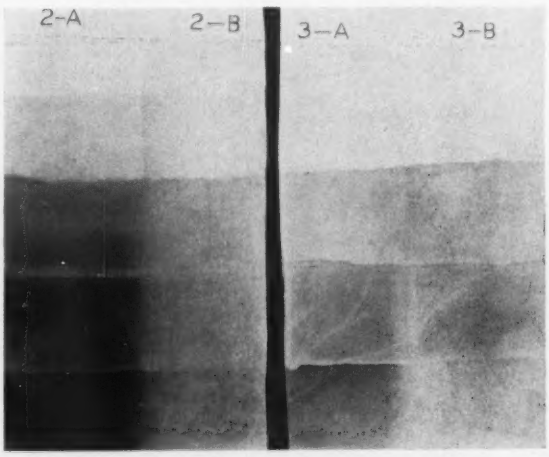


FIG. 3—Effect of diethylene glycol in reducing the discoloration of smoked sheet white sidewall compounds in which all but the activation zinc oxide has been replaced with Hi-Sil.

Sheet 2 was cured with a Hepteen Base-TMTDS combination, the two halves being identical except that A contains no glycol and B contains 2 PHR. Sheet 3 was cured with an MBTS-DPG combination, and again the halves are identical except that A has no glycol and B has 2 PHR. Beginning at the top, strips were exposed for 0, 8, 24, 48 and 120 hours to a G.E. S-1 Sun Lamp.

compounds containing various types of rutile titanium dioxide (Titanox RA, RA-50, and RA-NC) and the anatase form (Titanox A-MO). Use of the rutile types resulted in no noticeable improvement in discoloration of compounds in which all but the activation zinc oxide was replaced.

This result does not agree with those of Breckley who has reported *(2)* that "rubber containing anatase grades of titanium pigments would discolor in sunlight unless substantial amounts of zinc oxide were present."

As the rutile grades are slightly higher priced than the anatase grades and appear to offer no decided advantage in Hi-Sil loaded low zinc oxide compounds, the use of the cheaper material is suggested.

Summary of Recommendations

Based on this and other work not detailed here, the following recommendations are made for the compounding of Hi-Sil loaded natural rubber white sidewall stocks:

1. Use of pale crepe gives a slightly whiter compound than does No. 1 R.S.S. Its use is desirable but not absolutely necessary.

2. Stearic acid is necessary in W.S.W. compounds containing Hi-Sil. The use of 2 PHR is suggested.

3. Use of normal amounts of sulfur in the 2.5 to 3.0 PHR range is suggested. 2.9 PHR of sulfur were used throughout this work but this amount may be adjusted to suit the individual factory's preference.

4. The use of a thiazole-DPG combination is preferred over a Hepteen Base-T.M.T.D.S. combination in Hi-Sil stocks although the latter can be used satisfactorily.

5. Use of about 1 PHR of a non-staining antioxidant such as 2246 is permissible. Agerite Stalite does not appear to be satisfactory.

6. A protective wax, such as Sunproof, is needed for sun checking resistance. Three PHR of Sunproof were used in this work but this amount may be adjusted to suit the individual factory's preference.

7. Approximately half of the zinc oxide in a commercial natural rubber white sidewall can be replaced by an equal volume of Hi-Sil without noticeable effect on the color of the stock after sunlight exposure. Titanium dioxide and acceleration must be increased to do this. Physical properties are improved by replacement of zinc oxide with Hi-Sil. Volume cost of the compound is reduced as zinc oxide is replaced. When larger amounts of zinc oxide are replaced by Hi-Sil the discoloration becomes severe unless other compounding changes are made. This is explained in the next paragraph.

8. All of the zinc oxide in a commercial natural rubber white sidewall, except that needed for activation, can be replaced by an equal volume of Hi-Sil if a discoloration depressant is used. Such a material is diethylene glycol. Color of the resulting compound is equal to that of the commercial control before exposure and is superior to it after sunlamp or outdoor exposure. Physical properties of the Hi-Sil compound are much better than those of a high zinc oxide stock and volume cost is much lower. The use of diethylene glycol is essential unless only partial replacement of the zinc oxide is contemplated.

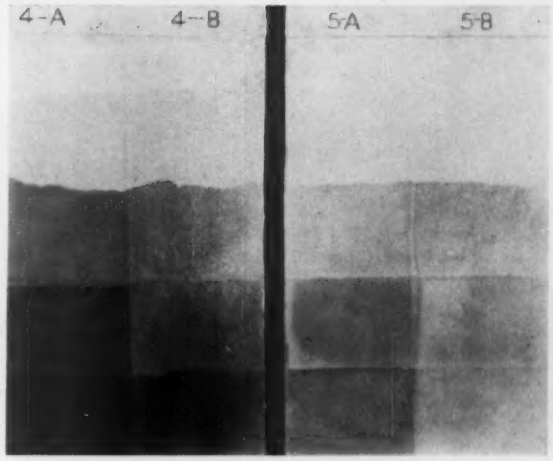


FIG. 4—Effect of diethylene glycol in reducing the discoloration of pale crepe white sidewall compounds in which all but the activation zinc oxide has been replaced with Hi-Sil.

Samples 4-A and 4-B were cured with Hepteen Base-TMTDS, the A portion containing no glycol and the B portion containing 2 PHR. Samples 5-A and 5-B were cured with MBTS-DPG, the A portion containing no glycol and the B portion containing 2 PHR. (Note: sample 5-B is the same as sample C in Figure 1). Beginning at the top, strips were exposed to 0, 8, 24, 48 and 120 hours to a G.E. S-1 Sun Lamp.

9. Use of 25 PHR of titanium dioxide is recommended when all of the zinc oxide is replaced by Hi-Sil. Anatase and rutile types appear to be equally satisfactory.

LITERATURE REFERENCES

(1) Columbia-Southern Chemical Corp., "Acceleration of Hi-Sil Compounds with Thiazole-Guanidine Combinations," Pigment Data Bulletin 50-10, September, 1950.

(2) Breckley, J., "The Application of Titanium Pigments in Rubber and Plastic Compositions," *R.A. (N.Y.)*, Vol. 70, p. 597 (February, 1952).

Instruments Accelerate Research. (Data Book 15-14). Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Wayne and Windrim Aves., Philadelphia 44, Penna. 8½ x 11 in. 96 pp.

Completely revised, this bulletin has been augmented to include many items not covered in the previous edition and has been brought up to date to include the latest designs of various analytical equipment. Although issued as a company catalog, it is actually a manual of such equipment. It is divided into three sections covering, respectively, analytical apparatus, precision laboratory measuring instruments, and research apparatus components. The bulletin is profusely illustrated and is attractively printed in two colors.

Fatty Acids. Association of American Soap and Glycerine Producers, Inc., 295 Madison Ave., New York 17, N. Y. 8½ x 11 in. 20 pp.

The technology and usage of fatty acids from an all-industry point of view is covered in this booklet. It describes fat-splitting processes, separation of individual acids such as stearic and oleic, and methods used in purification and chemical modification of the natural acids. A composite flow sheet shows how various animal fats and vegetable oils are processsed to yield dozens of different specification products. A review of major uses for fatty acids of different composition is supplemented with a usage chart showing more than 60 specific applications for these materials.

Shown above is the new $1,000,000 reclaiming plant opened by the Boston Woven Hose & Rubber Co.

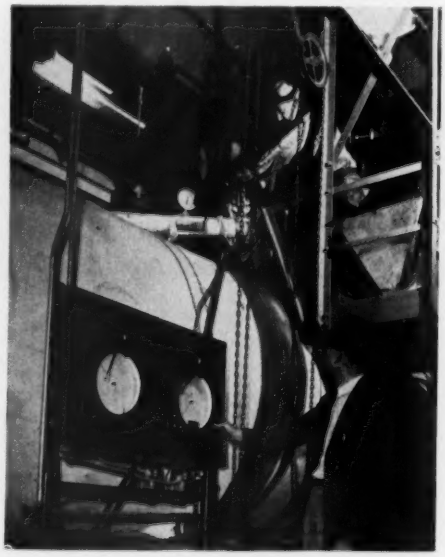
This photograph shows a tire being heaved into the cracker, the initial step in the devulcanization process. Machines automatically separate rubber, steel, cotton and rayon for re-use.

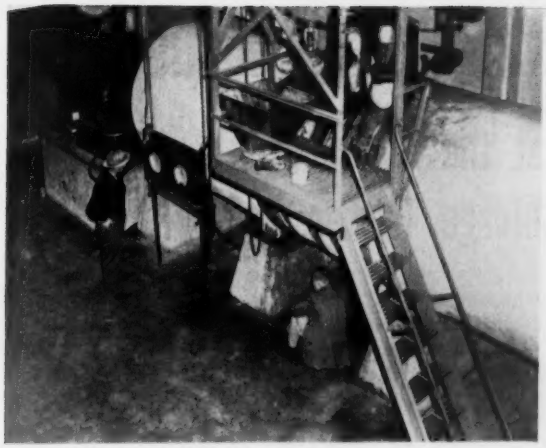
Boston Woven Hose New Reclaim Plant

BOSTON Woven Hose & Rubber Co. recently placed into operation its new $1,000,000 rubber reclaiming plant at Cambridge, Mass. Employing new processes, the plant is largely automatic and has an annual capacity of 7,200 tons. Termed by the company president, John M. Bierer, "the latest in design, encompassing all the best known features of reclaiming systems to form the most modern, continuous digester process plant in the United States," the new plant will reduce reclaiming operations from 24 to 8 hours.

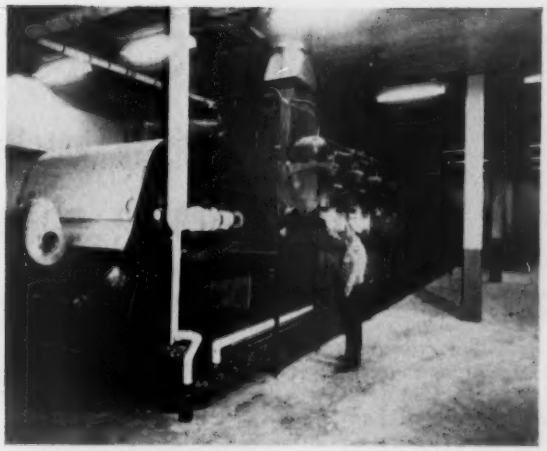
The Mil-strainer, shown to the left, sifts out any metal and other foreign matter. Note conveyor screw (upper right) which operates between the mixer and the feeding hopper.

The photograph to the right shows steam pressure being checked as "cooking" starts in a 3,500 gallon digester at the company's new rubber reclaiming plant.





The digester shown above is ready to discharge (blow down) the new devulcanized salvage at the new reclaiming plant.



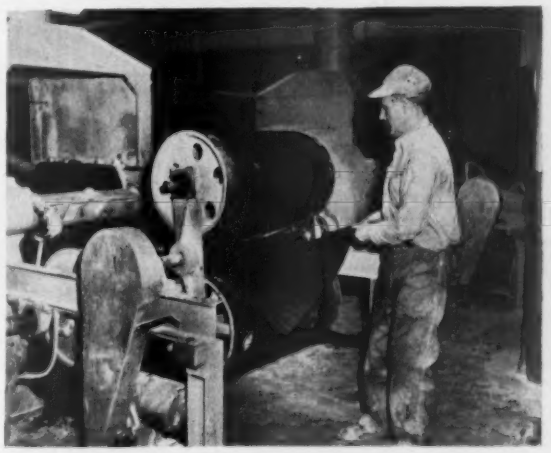
This photograph shows driers removing moisture from the digested stock, another step in the reclaiming process.

Mr. Bierer officially inaugurated the new plant by throwing the first piece of scrap—a used whitewall automobile tire—into the cracker, the initial step in the reclaiming of rubber. He said it is significant that the famous alkali process for reclaiming was pioneered at the Boston company in the 1890's and that one of the earliest patents for reclaiming vulcanized rubber was granted to another New England company in 1858. Mr. Bierer also said that the great production demands being placed upon the rubber industry made it essential to the national security and economy that "enormous efforts" be devoted to the reclaiming of rubber. He noted that there was considerable evidence that improved reclaiming processes held promise for lower costs in mechanical rubber goods.

Mr. Bierer summed up the situation by stating that the better and faster a reclamation process, the more economically and efficiently can the industry produce rubber products which require reclaimed materials. "Reclaim possesses some unique properties making it superior to natural rubber in certain respects," Mr. Bierer asserted. It was indicated that the new reclaiming plant was of high interest to the government, as reclaimed rubber had been placed on the critical materials list during the early stages of the Korean War.

Engineered entirely by a company staff headed by D. O. Johnston and G. E. Apel, under the supervision of James C. Walton, the plant, which is the only windowless one in the industry, uses a wide variety of scrap. Automobile tires and tubes, plus various types of scrap from rubber manufacturing, are employed in the company's new process, described by Mr. Walton as "a high neutral system." He pointed out that the new process, as yet undisclosed, not only produces a high quality devulcanized grade of rubber and synthetic (GR-S), but also recovers a considerable quantity of cotton and rayon cord and steel wire from automobile and truck tires. The new reclaiming process was described as being essentially an automatic system from the first step (cracking) through air separation and on to digesters, washers, driers, mixers, strainers and refiners to the final finished reclaim.

In view of the amount of reclaimed rubber produced, the size of the force required to operate the plant is remarkably small. Three shifts of only ten men each are required to keep the plant functioning on a 24-hour basis.



Shown here is a close-up of completely processed sheets of reclaimed rubber rolling from the refiner at the new $1,000,000 plant.

The final step in the manufacture of reclaimed rubber is shown above as sheets of the material are inspected in the storage room of the new plant.

GR-S and Its Uses in the Rubber Industry

A Panel Discussion Held at the November 21, 1952, Meeting of the Chicago Rubber Group

THE Chicago Rubber Group held an interesting panel discussion on "GR-S and Its Uses in the Rubber Industry" on November 21, 1952, at the Morrison Hotel in Chicago, Ill. The panel was presided over by Calvin S. Yoran (Brown Rubber) who also delivered a short talk on the subject "Use of GR-S in Sponge." The panel members, all of whom delivered talks, included John S. Kramer (LaCrosse Rubber), R. N. Hendriksen (Corduroy Rubber), James B. Braden (Industrial Rubber Goods), H. A. Winkelmann (Dryden Rubber), E. C. Svendsen (U. S. Rubber), and A. F. Reznicek (OSR Technical Service Division). Dr. Winkelmann chose as his subject "GR-S in Molded Goods," while Mr. Hendriksen concerned himself with "GR-S in Tires." "Use of GR-S in Footwear" was the subject of a talk by Mr. Kramer, and Mr. Braden chose as his topic "GR-S in Extruded Goods." "Use of GR-S in Foam" was covered by Mr. Svendsen, and Mr. Reznicek spoke on "Functions of the Technical Service Branch, Office of Synthetic Rubber, Reconstruction Finance Corporation." Following the presentation of the talks, a question-and-answer period was held. The talks presented at the meeting, as well as the questions asked and answers given, follow:

Use of GR-S in Sponge

By CALVIN S. YORAN

Brown Rubber Co., Inc., Lafayette, Ind.

SOME ten years ago, most of us were just getting acquainted with a new synthetic rubber called GR-S. During those ten years we have seen tremendous strides in the use and improvement in this synthetic which has been able to replace natural rubber during the war emergency and the postwar years of rubber shortage. Even with natural rubber available again, many of us continued to use GR-S without government legislation or compulsion.

It is not the purpose of this program to trace the history of GR-S but rather to point out how and why it has found its place in our industry. We believe there has not been enough promotion or publicity given to this and it is our purpose to bring to you examples of how GR-S has proven itself in several segments of our industry.

My own interest has been in sponge rubber manufacture and I will try to start this panel off with a brief outline of how GR-S has found its place in the chemically blown sponge industry.

First of all, I would like to point out that GR-S has been made in several grades, running into the thousands, designed for specific applications. It is my own belief that its success now and in the future depends upon this fact, that it can be tailor-made to do a specific job. I realize that the Office of Synthetic Rubber cannot make a special grade for every customer and has to attempt to standardize and keep the number of polymers to a minimum. We have found OSR very cooperative in trying to give our industry a polymer best suited for sponge manufacture.

In our laboratory at Brown Rubber immediately after the war, we found that the alum-coagulated polymers were less tacky on mills and calenders after we had plasticized them and mixed sufficient plasticizer to allow them to blow properly. The first polymer which we used was GR-S 20-AC and we made considerable sponge with this polymer.

GR-S 20-AC had a disadvantage in automotive sponge since it contained an antioxidant which stained automotive finishes. Several of us brought this problem to the then Rubber Reserve and a special polymer was made, first as experimental polymer GR-S X-317 and later GR-S 45-AC.

While GR-S 45-AC made satisfactory sponge after plasticizing with a peptizing agent, several of us felt we could go one step further and eliminate the plasticizing step. Dick Harmon, technical consultant, aided us in securing experimental polymers GR-S X-415 and X-421. The latter was found best and it became GR-S 30-AC. This polymer was non-staining and alum coagulated and had a Mooney plasticity of 30 ± 5.

While there have been minor changes in modifier, antioxidant, shortstop, etc., this basic polymer is still widely used in the sponge industry and now has the code number 1010. We have continued to use high percentages of GR-S as compared to our total rubber hydrocarbon consumption because we do not have costly breakdown and we increase our Banbury capacity through elimination of breakdown time. Other advantages which might be pointed out are less staining than a natural rubber adequately protected with an antioxidant, no tendency for reversion on overcures, and better skin forming ability in applied skin, as well as better ozone resistance of applied skin.

As for the future, we have a program in progress with the Kentucky Synthetic Rubber Corporation in which their pilot plant is making a series of new polymers which may offer still more desirable properties. This program will cover low temperature polymers, variation in styrene content and oil masterbatches. The added strength of cold rubber would be desirable and lower styrene might improve low temperature properties of the polymer.

Use of GR-S in Tires

By R. N. HENDRIKSEN

Corduroy Rubber Co., Grand Rapids, Michigan

IN its infancy, synthetic rubber, or more specifically Buna S as it was commonly known then, was more cussed than discussed by most tire chemists and compounders who had "teethed" on Hevea. It was tough and difficult to process, relatively low in tensile, short on elongation, and rough extruding, with finished treads which yielded minimum service. To a public also educated to the values of natural rubber, Buna S developed a bit of an unsavory reputation. Today, however, that reputation has been overcome very convincingly to the point where almost 50% of the rubber hydrocarbon used in the country is GR-S of one type or another, the major share being used by the tire industry.

Those of us in tire manufacture started with GR-S Standard (which was salt-acid coagulated), progressed to GR-S AC (alum-coagulated), and from this to GR-S 10 (rosin soap type). About this time came the carbo-masterbatches, which were 50 parts channel black coagulated with 100 parts GR-S.

Today we very definitely have regained the public's confidence with the much-publicized low temperature polymer (LTP), or 41°F. "cold rubber" as it is more commonly known. The importance of this polymer to the American public was recently emphasized by no less an authority than Col. C. M. Hulings, operating vice-president of the Copolymer Corporation of Baton Rouge, La. Writing in one of the rubber industry's journals, Col. Hulings stated: "American motorists have saved over $347,000,000 through use of cold rubber in 69,000,000 passenger tires in the five-year period ending June 30, 1952. This savings was the result of increased mileage, estimated at more than 25%, obtained through use of cold rubber in passenger tire treads."

Actually coupled with the trend toward HAF (high abrasion furnace) blacks, cold rubber has yielded from 20 to 30% better tread wear than was possible with natural rubber. Tire chemists have utilized cold rubber not only in passenger and light truck treads and sidewalls, but in carcass stocks in a blend with natural rubber. We find it easier to process, less scorchy, better aging in the uncured state, and more uniform in the extruded shapes.

However, cold rubber has not completely eliminated the difficult problems which arise from overload, high heat build-up, cutting and chipping on such tires as heavy-duty truck, over-the-road and off-the-road sizes. We do have one ray of hope, however, and that is that when LTP is compounded with the new SAF (super abrasion furnace) black, tests have shown service on heavy-duty truck tires to be almost as good as natural rubber.

A most important recent product of the RFC experimental program is the oil-extended LTP, with oil content varying from 25 to 50 parts, and the oil-black LTP polymers, both of which give final product of normal Mooney but yield 10 to 20% improvement over LTP in tread wear at a substantial saving.

As regards the future of GR-S in tires, we have two new types of GR-S still undergoing experimental development: (1) "Alfin" rubbers, which formerly were extremely tough and very difficult to handle in processing, but when manufactured with the oil masterbatch method show much improved processing and dynamic properties superior to LTP and approaching Hevea; (2) A second new type of GR-S approaching LTP in physical properties which can be produced in non-refrigerated equipment is that which utilizes the Nitrazol CF (aromatic nitrogen diazo compound) catalysts.

We in the tire industry feel we have every right to be optimistic about the future of GR-S and to expect an increasingly popular response of motorists to its service in the field.

Use of GR-S in Molded Goods

By H. A. WINKELMANN

Dryden Rubber Division, Sheller Manufacturing Corp., Chicago, Ill.

THE creation of a synthetic rubber industry in this country during World War II was an outstanding achievement. In spite of inherent defects in the GR-S and lack of know-how in compounding and processing of GR-S on the part of the rubber manufacturers, it was not long before GR-S was widely used in the mechanical rubber goods industry. The introduction of Cold GR-S, Arctic GR-S and Low Water Absorption GR-S serve to illustrate the versatility of GR-S because tailor-made rubbers can be made to meet specific requirements.

GR-S is cleaner than natural rubber and more uniform in plasticity and rate of cure. It is more resistant to oxygen and elevated temperatures and shows less tendency to reversion. It is more resistant to ozone cracking and outdoor weathering. The abrasion resistance of GR-S products is consistently superior to natural rubber. The improvement in electrical, steam and water resistant properties of low water absorption GR-S is such that it is doubtful whether rubber manufacturers concerned with such products will ever go back to natural rubber regardless of price.

Arctic types of GR-S have better low temperature properties than natural rubber and are widening the use of GR-S in the sub-zero temperature field. GR-S is more resistant to the action of vegetable and animal oils.

GR-S shows poorer hot tear, lower resilience and greater hysteresis loss than natural rubber. It has low tensile strength in pure gum compounds, although non-black compounds with good physical properties can be made with a silica filler.

A decline in natural rubber prices below that of GR-S will decrease the use of GR-S. However, when processing and quality are considered, GR-S is preferred and will hold its own.

Use of GR-S in Footwear

By JOHN S. KRAMER

LaCrosse Rubber Mills Co., LaCrosse, Wisconsin

I WOULD like to list some of the advantages and disadvantages of the use of GR-S in the manufacture of rubber footwear. Some of the advantages obtained from the use of GR-S are due to the fact that GR-S in the unvulcanized state is less thermoplastic than natural rubber. These are: (1) Reduced pressing, book marking or distortion of the calendered sheets in storage; (2) Reduced blistering during vulcanization due to moisture in fabrics; (3) Reduced sagging of unsupported calandered sheet during vulcanization.

Other general advantages are: (1) Less breakdown is necessary before mixing or calendering; (2) Better calendering and retention of design; (3) Improved resistance to flex-cracking in the finished product.

Some of the disadvantages resulting from the use of GR-S are: (1) Loss of building tack; (2) Low quality of colored stocks; (3) Stiff, high modulus stocks due to high loadings of reinforcing fillers necessary for low shrinkage and high quality; (4) High shrinkage of other than cross-linked GR-S polymers.

The most important single disadvantage of the use of GR-S in the manufacture of rubber footwear is the loss of building tack. In the footwear industry, using natural rubber, very little cementing is done to secure adhesion between rubber surfaces. However, during World War II, when 90% of the rubber hydrocarbon used was GR-S, all rubber parts had to be cemented with natural rubber cement to secure building tack.

Since World War II, with natural rubber in more plentiful supply, GR-S has been used for the most part in blends with natural rubber in order to secure some of the advantages of the use of GR-S while minimizing the disadvantages. During the last period of natural rubber restrictions, the footwear industry used a minimum of 30% GR-S in blends with natural rubber.

Ten years ago the only polymer available was Standard GR-S. At the end of World War II non-staining GR-S 50 was widely used. When the low-shrinkage, cross-linked GR-S 60 and non-staining 62 became available, they were widely adopted in the footwear industry for blending with other GR-S polymers and natural rubber. Recently, the rosin acid-emulsified cold rubber polymers such as GR-S 100, X-625 and 1501 have been used in combination with natural rubber and GR-S 62 to obtain higher quality and better building tack. It has been necessary to blend some cross-linked polymer with these cold rubbers to reduce shrinkage.

Currently, there is a program in progress at the Kentucky Synthetic Rubber Corporation to produce improved cross-linked polymers with low shrinkage and higher quality. Some of these new experimental polymers have indicated promising results.

Use of GR-S in Foam

By E. C. SVENDSEN

U. S. Rubber Co., Mishawaka, Indiana

SCARCITY of GR-S latex is the chief handicap to broader use of the material. Demand has exceeded supply ever since "cold" types have become available. One of the major consumers of GR-S latex is the latex foam industry. Although no one is manufacturing foam products from 100% GR-S, the improved tensile strength of the low temperature polymers permits the use of larger proportions of GR-S to natural latex.

There are a number of types of latices available, either "hot" or "cold," and ranging from 100% butadiene with no styrene up to 50:50 monomer ratios. Even higher styrene content copolymers are produced on a large scale but, by definition, these are not considered to be GR-S. Their end use is essentially in paints. To obtain the best final product properties, the selection of the type of GR-S is equally or even more important than the compounding. A considerable amount of latex development work is being carried out to make it possible to obtain still better latex properties for special jobs.

The compounding of GR-S latex follows along the same lines as natural latex. Since the tensile strength is initially low, prevention of over-cure is essential. In general, GR-S latex is more tolerant to the addition of chemicals than is natural latex. Although the usual precautions of wetting down pigments into slurries and emulsifying hydrophobic liquids must be followed, the GR-S latex compounds are ordinarily more stable than similarly compounded natural latex compounds. This is likely due to the soap system of stabilizers and the absence of ammonia which activates zinc oxide.

Adjustment of stability is a prime need in latex compounding to achieve good processing. In order to consider properly the adjustment of stability of the latex, studies of particle size distribution are helpful, and a knowledge of the soap system of the particular latex being used is necessary. Such information is available from the latex producer.

The question of antioxidants is always a good one for debate, but it seems certain that the use of a good heat stabilizer is a primary need. Other than that the highly cross-linked latex polymers seem fairly resistant to the rigors of accelerated tests.

In the final analysis, GR-S latex is a material that already has been given acceptance on a large scale for both economic and quality reasons just as it has in dry rubber compounding. Its future should be very bright.

Use of GR-S in Extruded Goods

By JAMES B. BRADEN

Industrial Rubber Goods Co., St. Joseph, Michigan

EXTRUDED goods, for the purpose of this discussion, are the products of the pre-conditioning and continuous forcing of a vulcanizable GR-S stock through a die by means of a screw, and the post-die treatment that is required.

As compared to natural rubber, GR-S cannot be extruded with the same freedom of compounding, nor can the higher tensiles be reached. For factory processing, however, GR-S is superior. In the case of natural rubber, nerve could be removed by heat or mechanical breakdown. In GR-S this nerve must generally be compounded out.

It has been our experience that there is little choice among the common types of GR-S as to their extrudability. GR-S polymers of higher styrene content do tend to extrude more smoothly and the cross-linked or divinyl benzene polymer aids somewhat but only with a sacrifice of physical properties.

For high quality extruded goods it is usually necessary to use a high structure black, either by itself or in combination with other pigments. Here the compounder must be wary of his high temperature mixing conditions which may tend to cause gel formation in the GR-S or a carbon-gel complex. Thermal blacks and mineral fillers can be used if the stock is loaded high enough.

The selection of processing aids also has a lot to do with the appearance of the finished product. Resins, waxes, peptizers, plasticizers and extenders all play their part. Another critical point in the producing of a good extruded stock is the control of the mixing cycle and Mooney viscosity to insure as much as possible uniform characteristics in the batch and from batch to batch.

Extruded goods of today are run to very close tolerances and in most cases the extruded section is magnified 10 times and its shadow superimposed on the blueprint as a control. It is not uncommon to hold tolerances as close as plus or minus one-half of one-sixty-fourth of an inch.

Functions of the Technical Service Branch of the Office of Synthetic Rubber

By A. F. REZNICEK

Office of Synthetic Rubber, Reconstruction Finance Corp., Washington, D. C.

AS many of you know, that part of the Reconstruction Finance Corporation which was formerly referred to as Rubber Reserve, and later as the Synthetic Rubber Division of the Office of Production, has recently been designated as the Office of Synthetic Rubber. This office is made up of six main Divisions, one of which is the Sales Division. This Division functions as the principal intermediary between the Office of Synthetic Rubber and the rubber consuming industry.

For many years you have been dealing with the Operations Branch of the Sales Division as far as your over-all synthetic rubber requirements were concerned, but there never has been a single point of contact within the office where problems of a technical nature could be discussed. Recently, a new Technical Service Branch was established within the Sales Division, and all consumer problems of a technical nature will be handled by this branch. In general, this branch is a means of liaison between consumers of synthetic rubber and the various Divisions of the Office of Synthetic Rubber.

In this discussion, we shall confine our remarks to points with which the Technical Service Branch is concerned. We are organizing this Branch as rapidly as we are able to get the qualified personnel. For maximum benefit, we are doing our best to staff this group with technologists who have broad compounding and processing experience in the manufacture of a maximum number of the many diversified end products. A limiting factor, however, is the fact that there are considerably more types of products than permissible personnel.

Early in 1952 a new numbering system was put into effect for established GR-S polymers, and the total number of polymers was reduced from over 100 to 65. Further reduction in the number of polymers was established as a matter of policy for the future. This program is a specific responsibility of the Technical Service Branch. As far as we know, no one disagrees with the theory and advantages to be gained in having a minimum number of polymers. However, the actual accomplishment is another matter if there is not a reasonable basis for it. It appears at this time that an orderly and satisfactory plan can be devised based on certain considerations.

Recent shipments of GR-S reflect over 50% of industry's requirements is in low temperature polymerized, so-called "cold" polymers totaling 12 in number; the remainder is in approximately 56 polymers of which 36 are hot polymers. Most users of these hot polymers should find quality advantages with no economic disadvantages in changing to cold polymers. There are exceptions and work is being done toward bridging these gaps with satisfactory cold polymers. Furthermore, broader replacement of hot polymers with cold polymers is in the interest of raw materials conservation.

Considering the oil-masterbatch cold polymers, interchangeability of certain oils and possible elimination of certain polymers containing oils in the lower proportions

should permit narrowing that group to something like 6 polymers. To more fully explore the possibilities, a few experimental oil-masterbatch polymers are being added with the idea that the consolidation as proposed in our July 25, 1952, memorandum to consumers, should only be delayed a short time. This delay seems justified if the indicated economic and conservation advantages can be realized.

To briefly touch on some other possibilities, it is evident that two of the present five cross-linked hot polymers can serve all requirements, or perhaps one can be developed to serve in place of all five with quality improvements; and two of the hot-black masterbatch polymers could be replaced with one cold-oil-black-masterbatch polymer with quality and economic advantages.

There is no intent or inclination to reduce the number of polymers at the expense of new and improved ones; rather, it is believed that each new polymer should be justified for quality or economic reasons, and as a result such a new polymer should replace the one or more over which it exhibits an advantage.

We have hit the high points only, and as a result may have unintentionally given some impression of oversimplification. In closing, we should like to state that any and all available information will be thoroughly studied before action is taken in each specific case.

Questions and Answers

Question—Does the selection of GR-S polymer influence the weather aging characteristics of compounds formulated from the various GR-S polymers?

Answered by Dr. Winkelmann: No, there does not appear to be any difference in the standard grades. At the present time, the oil-extended polymers do not age as well.

Answered by Mr. Kramer: We have not been able to find any difference in aging of hot or cold or even cross-linked polymers in footwear compounds.

Question—Does type of curative or plasticizer have any bearing on scumming of a metal mold? How can scumming be prevented?

Answered by Dr. Winkelmann: Yes, tetramethyl thiuram disulfide as well as some oils and waxes will scum molds.

Answered by Mr. Braden: It might be emphasized that molds should be cleaned thoroughly down to the metal.

Question—What do you consider the best heat-resistant accelerator combinations?

Answered by Dr. Winkelmann: Tetramethyl thiuram disulfide with MBT or MBTS activation and possibly selenium dithiocarbamate.

Question—How do you get smooth low durometer extrusions with mineral fillers?

Answered by Mr. Braden: You don't. 55-60 durometer is about the lowest possible but higher durometer stocks are better.

Question—What is the practical percentage of GR-S to natural rubber latex in blends to produce foam?

Answered by Mr. Svendsen: It depends on the relative prices of the latex. Some articles can be made of 100% GR-S latex but for large objects, such as mattresses, 20% GR-S is practical.

Question—Are 3,000 psi tensile values practical for specification use?

Answered by Mr. Hendriksen: No. By specifying 3,000 psi tensile values the purchaser probably feels he will get the best quality, but this does not necessarily hold true. Those properties most important in the application should be specified rather than tensile strength.

Answered by Dr. Winkelmann: With GR-S, 3,000 psi tensile is not practical except with a 60-70 hardness low temperature polymer.

Answered by Mr. Kramer: I also agree that this tensile figure is impractical and that other properties are certainly more important than tensile.

Answered by Mr. Braden: It certainly is impractical in extruded goods.

Question—Is it practical to use GR-S compounds in mechanical goods without added antioxidant?

Answered by Mr. Reznicek: No, not as a general thing; however, each case should be decided on its own merits. The common antioxidants are added during polymerization to serve as stabilizers during the drying process and storage prior to use in compounds, but are not necessarily sufficient to protect the finished product.

Question—What progress has been made toward eventual 100% use of GR-S in footwear?

Answered by Mr. Kramer: We are shooting for 85% use for possible emergency use. There are no economic advantages to be gained now in view of the extra cost of cementing with natural rubber cement which has to be done. In the event of higher natural rubber prices, the use of GR-S will probably reach 60-65%.

Question—Since it has been demonstrated that up to 33% can be saved in mixing times with lower peak power requirements, why is there such a reluctance to "up-side-down" mixing in the Banbury?

Answered by Dr. Winkelmann: If there was an actual 33% savings in time such a procedure would probably be used, but Banbury mixers would have to be in top condition with no leaks and be able to stand the high initial shock. Perhaps it can be done with some compounds and small batches. It would not appear that this procedure would give as good dispersion and most of us are looking for good dispersion.

Answered by Mr. Kramer: I have used this method in two different plants and it can be used on some compounds with a savings in time. However, on several occasions the Banburys were installed by the high peak load which was found to be several times normal peak load, which tends to contradict the statement contained in the question.

Question—Is the odor of GR-S a limiting factor in its use in foam?

Answered by Mr. Svendsen: No. It was a factor in early mattresses chiefly because of residual styrene monomer. Present latex foam is fairly well stripped so that odor is not a problem, but this must be watched carefully.

Question—Do GR-S tires show poorer skid characteristics?

Answered by Mr. Hendriksen: GR-S tires are better on wet pavement and poorer on ice but differences are small and can only be measured by carefully controlled equipment.

Question—Are there enough differences in properties to warrant the large number of GR-S polymers in production?

Answered by Mr. Reznicek: No. We hope to eliminate a number of polymers without sacrificing quality. It is no longer economical to produce certain polymers, particularly certain "hot" GR-S polymers whose volume is small, and others could be replaced by cold polymers to advantage.

Question—What is the greatest factor contributing to dimensional change in extrusions: the polymer, loading, pigment, or processing variations?

Answered by Mr. Braden: They are all factors. The polymers and processing are probably greater factors than pigment or loading. We have found variations in bag weights of blacks enough to cause variations when the bag is not weighed.

Question—What type of compounding ingredient for GR-S is most in need of improvement?

Answered by Mr. Hendriksen: In tires, we need better building tackifiers.

Answered by Mr. Kramer: In footwear we also need better tackifiers, a peptizer which would not encourage gel formation and give smooth calendering, and better light-colored reinforcing pigments.

Answered by Dr. Winkelmann: Ingredients which would improve ozone resistance and hot wear.

Answered by Mr. Svendsen: Accelerators which would give flat curing curves and better non-staining, non-discoloring antioxidants.

Answered by Mr. Braden: A low modulus smooth-out black.

Answered by Mr. Reznicek: One ingredient that is needed in the compounding of GR-S is a chemical that inhibits gel formation. If desirable, such a material could be used in the production of GR-S polymers as well.

Question—What is the procedure necessary to obtain a new polymer?

Answered by Mr. Reznicek: First there must be a special problem which requires the production of a new polymer, and the Technical Service Branch of the Office of Synthetic Rubber should be informed fully of the problem and desired characteristics of a polymer for it so that it can be determined whether or not there is already available a polymer that has the special properties needed. It is also necessary to know the approximate volume requirements since it is not economical to make a new polymer for small volume items. This information should be furnished to the Technical Service Branch, which will coordinate such information with the Research and Development Division, as it is the responsibility of that division to establish an experimental run if it is deemed desirable.

Treatment of Galvanized Iron with Vinyl Resin Coating

GALVANIZED iron treated with a Vinylite resin-based coating lasted twice as long as ordinary galvanized iron under severe conditions of a salt spray fog cabinet test before showing any signs of corrosive breakdown. These tough yet flexible coatings based on Vinylite resins resist moisture, abrasion, aging, weathering as well as corrosive acids, alkalies and most other chemicals. Tests conducted by an oil company in the Texas Gulf Coast area on Vinylite resin-based coatings developed by Plastic Coating Corporation, Houston, Tex., compared durability of these coatings with iron oxide primer and galvanizing under the same severe corrosive conditions.

Exposed for 1204 hours continuously in a salt spray fog cabinet, one panel of corrugated, galvanized iron, unprepared but treated with a wash primer and top coat based on Vinylite resins, showed no signs of corrosive breakdown throughout the test. The uncoated panel lasted only 672 hours under the same severe conditions before the galvanizing completely deteriorated. This salt spray fog cabinet test consists of a continuous fog of synthetic sea water at 92 to 95°F. and at 100 percent humidity. Similar tests under these conditions revealed the superior protection of Vinylite resin-based coatings for both wire brushed and sand-blasted black iron, which were degreased before treating.

Two black iron test panels, both degreased and wire brushed, were also exposed in the salt spray fog cabinet for 1204 hours. The panel with a coating based on Vinylite resins showed no corrosive breakdown except at an uncoated, unprotected hole, while the same panel with a conventional coating of iron oxide primer broke down almost completely and showed poorest resistance to salt spray.

Other results of these tests indicated that coatings based on Vinylite resins gave better metal protection when the surface was first prepared by sand-blasting as against wire brushing. The extreme chemical inertness of Vinylite resins makes coatings based on them ideal for protecting metal surfaces exposed to severe weather conditions and corrosive chemical atmospheres. Galvanized iron water tanks, supply sheds, cast iron garden furniture and other exposed metal structures have longer service lives when treated with a Vinylite resin-based coating for corrosion protection.

Editorials . . . . . .

Government Disposal

THE long-awaited recommendations of the Reconstruction Finance Corporation with regard to the disposal of the government-owned synthetic rubber production facilities have been made. As detailed elsewhere in this issue, the recommendations took the form of a 65-page report to the President and Congress and followed closely on the heels of the engineering appraisal of the facilities made by the Ralph M. Parsons Co. of Los Angeles. According to the letter of transmittal by RFC Administrator Harry A. McDonald which accompanied the report, the government is now in a position to proceed with disposal as soon as permissive legislation is enacted. Such legislation is not apt to be enacted as quickly as some people think.

The RFC plan, which covers twenty-nine separate production facilities, including copolymer plants with total annual capacities of 860,000 long tons of GR-S and 90,000 long tons of GR-I, is far from the last word on this complicated subject. According to the terms of the Rubber Act, a formal plan for disposal must be submitted by President Eisenhower to Congress by April 15 and Congress must then prepare disposal legislation. It is not incumbent on the President to accept the RFC recommendations as such, although there is little doubt that he will accept most of the pertinent points. Since President Eisenhower has several times expressed the opinion that government should not compete with industry, there is little likelihood that he will upset the apple cart at this stage, but he may disagree with the proposed method of disposal.

The RFC report indicates that the original cost of the 29 plants involved amounted to approximately $500,000,000 and that their current book value is $172,600,000. The report, however, gives no indication of any opinion with regard to the true economic value of these facilities, although a figure of $350,000,000 has been mentioned by Rep. Paul W. Shafer (Rep., Mich.), the "father" of the present Rubber Act. Conversations with a few leading rubber executives indicated that the $350,000,000 figure is generally acceptable to the industry, although a few expressed the opinion that it should be trimmed about $50,000,000. Morton E. Yohalem, special RFC deputy for rubber plant disposal, who prepared the special report with the assistance of James M. Wainger, has already predicted there would be a "hassle" over final prices.

Proposals advanced by industry to sell the plants via the sealed bid method were completely rejected by RFC in the report. In fact, even outright and complete negotiation was rejected. Instead, RFC proposes that an early deadline be set for the acceptance of non-binding "indications of interest" with actual open negotiations to be started shortly after the deadline date has passed. The sealed bid method was rejected on the grounds that prospective purchasers might possibly agree in advance to keep their bids low and avoid bidding against each other for specific units. In any event, it is estimated that it will take at least 15 months after Congress passes disposal legislation before the first plant is turned over to private industry. No individual sale would be completed under the RFC plan before the entire pattern of disposal was made available to Congress.

Some interesting data on the sale pattern of government-produced synthetic rubber was incorporated in the RFC report. According to the report, RFC sold general-purpose (GR-S) and special-purpose (GR-I) synthetic rubber to approximately 700 companies in 1952. Out of this group, the 20 larger tire companies took more than 77 percent with the remaining 680 companies taking 23 percent. The "Big Four" alone accounted for 63 percent of total 1952 sales. These figures indicate why many of the smaller rubber manufacturers in the industry are hoping that some of the chemical and petroleum firms will buy in some of the copolymer units, so that they will not be forced to purchase a basic raw material from competitors.

Market Data

READERS are referred to our new and enlarged Market Data Section which appears on pages 826 and 827 of this issue. In addition to raw rubber (natural and synthetic), cotton, reclaimed rubber and scrap rubber, market comments and prices are now furnished on liquid latex and industrial rubber fabrics. All sections have been enlarged and considerably more information is furnished. Since raw materials are so important a cost factor to every rubber manufacturer, large or small, we intend to expand this Section even further in the near future. We would like to make the Section as comprehensive as possible and accordingly welcome specific suggestions from our readers.

NEWS OF THE MONTH

RFC ISSUES REPORT RECOMMENDING PROGRAM FOR DISPOSAL OF SYNTHETIC RUBBER PLANTS

SALE of the Reconstruction Finance Corporation's synthetic rubber facilities for the maximum return to the government "consonant with the attainment of a competitive industry" was recommended by Administrator Harry A. McDonald in a 65-page report on a program for disposal of the plants furnished on March 2 to President Eisenhower and the Congress. In his letter of transmittal, Mr. McDonald pointed out that the facilities have been appraised by an independent engineering firm, and that the government was in a position to proceed with disposal as soon as permissive legislation was enacted. Involved in the disposal plan are twenty-nine facilities for the manufacture of synthetic rubber and its components. They represent total annual capacities of 860,000 long tons of GR-S and 90,000 tons of Butyl rubber, and were built by the government at a cost of more than half a billion dollars. The report was prepared under the supervision of Morton E. Yohalem, who was placed in charge of disposal activities last June. He was assisted by James M. Wainger.

The report makes the finding that the production of synthetic rubber now has developed to the point where, in private hands, it would be able to survive in competition with natural rubber. Assurance that the facilities will be maintained as "a going, progressive and readily expandible industry" is necessary, the report declares, "because the ready availability of synthetic rubber is vital to our national security."

In support of its finding with respect to the competitive position of synthetic rubber, the study adds: "In the light of present conditions and those likely to prevail in the future, privately-produced synthetic rubber would be fully competitive with natural, both technologically and in terms of price. Moreover, it is expected that the future world requirements for new rubber will so greatly exceed the available supply of both natural and synthetic as to necessitate the construction of new synthetic rubber facilities to satisfy the demand."

Calls for Competitive Forces

The disposal plan calls for the development of an industry pattern that will permit the free operation of competitive forces "by avoiding situations of dominance and by assuring a supply of rubber to those users who do not purchase facilities."

The plan recommended by the RFC provides for public notice inviting "indications of interest" for the purchase of the facilities. At the end of the period set for the receipt of "indications of interest", the disposal agency designated by the Congress would negotiate with the bidders, guided by the dual objectives of realizing the full fair value of each facility for the government and assuring that the facilities would be disposed of in such a manner as best to provide for fair and effective competition in the production and marketing of synthetic rubber and its components.

Other highlights of the report are: (1) A proposal that 80 per cent of the sales price of any facility in the disposal program may be secured by a 10-year purchase money mortgage "so that the market for the facilities will not be unduly restricted:" (2) A recommendation that a maximum supply of rubber and its components be built up by the government prior to the time of transfer and made available to plant purchasers in order to prevent a temporary shortage as a result of the adjustments required by the transfers; (3) Provision that research in rubber should not be interrupted as a result of disposal of the facilities to private companies.

The RFC's recommendation won't necessarily be followed by President Eisenhower. Under the law, he must submit his own disposal plan to Congress by April 15. After that, the lawmakers will have the final say as to how the plants are put on the public block. Morton E. Yohalem, the RFC official who drew up the report, said that he thought it would take about 15 months for the plants to be sold if Congress approved this disposal program.

While the RFC's report predicted the synthetic rubber industry would flourish under private management, and that it would be "fully competitive" with natural rubber, it is generally conceded that private companies will have to raise the price of synthetic rubber several cents a pound since it will cost them more to produce than it does the government. For example, the government has procured a large part of its styrene—an important ingredient of general purpose synthetic rubber—at cost from its own facility at Torrance, Calif., and has bought most of the remainder at well below market prices from four styrene facilities which it sold just after World War II. This latter amount was bought under contracts that reserved substantial quantities for government use at prices close to cost.

The report rules out competitive bidding. Commenting on this, Mr. McDonald explained that competitive bidding "in a deal like this doesn't lend itself to the type of protection we want to have." The report itself states that "sale of the facilities to the highest bidder in every instance under competitive bidding would be inappropriate."

The RFC recommended that the plants be sold in the following specific manner: Any company interested in buying a plant would send to the disposal agency—presumably the RFC—a so-called "indication of interest." The government would give companies about six months to notify the RFC of their intentions. Then the RFC would sit down with each company and negotiate a price for the particular plant a company has its eye on. RFC negotiators, according to the report, would insist on the government's getting "its full fair value" for the plant. Federal negotiators would also take into account the competitive position of each company applying for purchase of a plant. Each sale would have to be passed on by the government's antitrust watchdogs, the Justice Department and the Federal Trade Commission.

Congressional Approval Required

The plan also provides that no sale would become final until Congress approved the disposal program as a whole. After Congress gave its blessing, any plants not sold would be placed in a standby condition, and would not be operated by the government in competition with private industry. RFC officials admitted that if all the plants weren't sold there would be a "tightening in the synthetic rubber supply". This would happen since just about every pound produced now is being consumed by the industry. To partially com-

bat this situation, the agency's plan recommended that the government build up a maximum supply of synthetic rubber so that, when the transfer from public to private ownership took place, there would be a ready supply on hand to meet a "temporary shortage". Whether the RFC could build up such a supply is doubtful. At the moment it is selling all the rubber it makes.

Under the plan, financing arrangements would call for a 20% cash payment the balance to be carried by a first mortgage payable in 10 years. The agency explained it had worked out this arrangement "so that the market for the facilities will not be unduly restricted". Finally, the plan called for the government to carry on research in synthetic rubber for one year after the plants are sold.

The report gave no price figures, nor did it suggest which company should be permitted to operate any particular plant. It recognized that the facilities would have to be sold to companies big enough and financially sound enough to operate the costly program.

Earlier, on February 18, Representative Paul W. Shafer (Rep., Mich.), chairman of the House Armed Services Rubber Subcommittee and author of the Rubber Act of 1948, outlined to the House his thinking on the disposal of the synthetic facilities. Private industry, he said, should be prepared to pay at least $350,000,000 for the plants, which is about 80% of their estimated current value and about $100,000,000 more than the most liberal industry ideas of a fair price.

Warns of Continued Monopoly

Mr. Shafer warned that the alternative will be continued government monopoly until the plants wear out from obsolescence. In addition, he served notice that Congress will ask the government, if it retains ownership, to raise the price of synthetic rubber, thus adding millions of dollars in raw material costs to the tire and rubber products industry. He said that the government should treat its citizens to the same profit a corporate stockholder might expect.

The Michigan Republican said that he would introduce his plant disposal bill during this session of Congress and that Representatives should act upon the disposal question within the next few months. Subsequently Mr. Shafer took his subcommittee on a tour of inspection of rubber facilities in Akron. The subcommittee met informally with rubber officials to discuss the problem.

While the RFC proposal rules out competitive bidding for the plants, Mr. Shafer in his address to Congress stated that he saw no reason why the plants could not be put up for sale on a bid basis with the highest bidder earning the right to buy the plant if the bid price is reasonable and the award to the bidder would encourage competition and prevent monopoly.

Last August the rubber industry made a proposal to RFC outlining the manner in which it thought disposal should be handled. The industry plan, in addition to suggesting negotiated sales, would confine sales of the bulk of the plants to rubber companies. Mr. Shafer wants to widen the field of potential buyers to include smaller firms and possibly interested oil and chemical companies.

His suggestion that there should be no bar to common ownership of GR-S and feedstock plants runs counter to a recommendation of the Justice Department made several years ago. Chances are, however, that the department no longer would object. Rubber firms have expressed concern that such a ban would leave them without a reliable source of butadiene. Mr. Shafer's suggestion should help to relieve the industry's worries on this point.

Asks New Pricing Policy

If the government remains in the synthetic rubber business, he said, it should establish a new pricing policy "embracing every element of cost which would occur under private operation"—such as income taxes, sales and advertising costs and private interest rates for investment capital.

The natural rubber producers of Southeast Asia have demanded this step, charging that they are now forced to compete with a subsidized synthetic rubber. Mr. Shafer said he's confident that natural rubber will long enjoy a wide market here, but made no specific reference to their complaints.

His suggestion that this "subsidy" be eliminated by a higher price is bound to have a warm reception overseas, but equally may bring some fence-sitters in the American rubber industry around to favoring disposal. At least one major tire firm is reported to favor continued government ownership because it feels it can get synthetic cheaper from the government, aside from avoiding the risks of inventory losses.

Authorities differ on how much of a price hike this would entail, although they are generally agreed it would mean higher prices for GR-S. Mr. Shafer referred to an RFC profit of $16,113,542 on sales of $435,000,000 last year. The President's (Truman) budget message to Congress estimated a profit of $43,235,500 on sales of $335,200,000 in fiscal 1953 and of $58,799,000 on sales of $374,388,000 in fiscal 1954.

Selling and advertising costs for synthetic rubber, even for private industry, would be negligible, industry experts believe, while payment of income taxes, on the basis of these budget estimates, would still leave a healthy return on operations and investment—probably a return putting the industry in the current excess profits bracket.

Higher Operational Costs

The higher costs of private operation, according to most experts, would come primarily in taxes and in higher costs of acquiring raw materials than currently paid by RFC, which has favorable contracts for the raw materials which it doesn't produce itself.

Incidentally, on March 2, Mr. McDonald stated that RFC has no intention of raising the price at which it sells synthetic rubber at any time before Congress definitely decides on whether to approve sale of the rubber plants to private industry. He said that RFC would stick with the present price of 23c a pound while negotiating to sell the plants.

While Mr. Shafer's views on rubber policy are bound to be respected by many of his colleagues, they may run into opposition in the Senate. On the Senate side, the RFC report is now slated for Senator Homer Capehart (Rep., Ind.), chairman of the Banking Committee, who will pass it on to Senator John Bricker (Rep., Ohio), head of the Senate Banking Subcommittee on Rubber. Senator Bricker also headed this subcommittee in the 80th Congress. This means that the problem is being steered away from the Armed Services Committee under Senator Lyndon Johnson (Dem., Tex.), whose views have not always coincided with those of the rubber companies.

In 1948, Mr. Shafer was of the opinion that the state of the natural rubber stockpile was such that disposal of synthetic facilities might prove too risky. Mr. Bricker, however, was for disposal at that time. Today, however, there seems to be agreement in that Mr. Shafer says that the nation has an ample natural rubber stockpile. He also stated that the synthetic rubber industry will have a brighter future under private enterprise than under government control, although the government has done an "excellent job" of running the plants.

Another facet to the disposal problem came from some government officials who think they see an ulterior motive in some of the recently announced synthetic rubber developments. They suspect the discoveries were revealed at this time with the hope of keeping down the asking price of the government-owned plants. Their thoughts were interpreted in this way: if industry can show the plants are obsolete or are on the threshold of obsolescence, obviously the selling price will be lower.

Mr. Yohalem, when questioned on this matter by the press, said he looks for more rubber company announcements of "sensational developments" as disposal time nears. "I am a hardened sinner and I expect anything," Mr. Yohalem remarked. RFC contends that the discoveries will have no effect on the price of the plants despite the fact that such an eventuality has been widely predicted.

RFC Regains Butylenes

Aside from questions of disposal, problems still remained on the working level in the synthetic rubber program. Butylene production from three plants, previously under directives to supply this material for the aviation gasoline program, has been restored to the RFC for the synthetic rubber program, it was announced on February 17 by Deputy Petroleum Administrator J. Ed Warren.

Restoration of the butylene production to RFC without affecting aviation gasoline output is now possible, Mr. Warren said, because arrangements have been worked out with a number of petroleum refiners for replacement of the material with an equivalent amount of codimer—a liquid suitable for aviation gasoline manufacture.

Mr. Warren pointed out that the Petroleum Administration for Defense was authorized by the Office of Defense Mobilization to direct the butylenes from the three plants into aviation gasoline until February 20. Production from one plant was returned to RFC on January 15, from another effective on February 1, and from the third on February 12. From the first of the year the three plants have supplied in total about 40,000 barrels of butylene for use in manufacturnig high-octane aviation gasoline.

In mid-1952 the then Synthetic Rubber Division of RFC released the butylene production of the three plants to PAD for six months because there was no need for this production in the synthetic rubber program at that time. On January 1, RFC desired to regain control of the production, but ODM, in the light of the critical shortage of aviation fuel, gave PAD the power to direct the butylene into aviation gasoline. This power was originally granted for the period through January 20, and was later extended to run through February 20.

OPS Decontrol Actions

Rubber materials, commodities and services valued at $4,500,000,000 annually at the manufacturer's level were decontrolled by an amendment to General Overriding Regulation 3, Revision 1, effective February 13, 1953. The action applied to all products under the jurisdiction of the OPS Rubber Branch.

Except for certain record-keeping requirements, the amendment exempts the items affected from the provisions of the General Ceiling Price Regulation and the Manufacturer's Ceiling Price Regulation (CPR 22) as well as several tailored ceiling price regulations and supplementary regulations. Sellers of rubber products and services must preserve the records they have been required to keep by the various regulations, but need not keep records of future transactions.

The regulations and the products affected by the action are: GCPR, which includes natural and synthetic rubber, tires and tubes, certain molded, extruded and cut rubber goods, and sales of most rubber goods at wholesale and retail; GCPR, SR 49, which includes basic tire carcasses and recapped and retreaded tires; GCPR, SR 57, covering sales of GR-S; GCPR, SR 118, which covers ceiling prices for sales by manufacturers and brand owners of new replacement second line tires.

Also, CPR 22, covering many manufactured rubber commodities for which no tailored regulations were issued, such as covered thread, some hose and tubing, some hard rubber products, etc.; CPR 22, SR 8, covering footwear vulcanized as a unit, heels and soles, stationers' goods, etc.; CPR 22, SR 11, covering coated fabrics, etc.; CPR 58, covering reclaimed rubber; CPR 59, covering scrap rubber; CPR 62, covering tires and tubes for sales by manufacturers to private brand owners, and CPR 64, covering tire mileage rental of tires to commercial users.

The decontrol action does not apply to the services of applying retreads to an owner's tires and the covering of printing press rollers, which are covered in CPR 34 (services).

Russian Footwear Data

Among the key figures submitted by Politburo members to the recent Soviet Congress in Moscow were some pertaining to the rubber footwear industry. According to these figures, Russian production of rubber shoes in 1952 will amount to 125,000,000 pairs, or 80% more than those produced in 1940. No other comparisons are available. Under its latest five-year plan, the Soviet Union intends to increase production of synthetic rubber by 82% over 1950 production, but specific figures for such production are lacking.

The National Production Authority, on February 8, also acted to revoke Order M-45. The only remaining item on the order was Thiokol. In taking M-45 off the books, NPA said supplies of Thiokol have now been balanced with civilian and military needs.

Other news came from the Secretariat of the Rubber Study Group which estimated that world consumption of natural and synthetic rubber in 1952 totaled 2,332,500 long tons, a new high record compared with the previous record of 2,312,500 tons, in 1951.

United States consumption increased from 1,214,298 tons in 1951 to a new high of 1,260,588 tons in 1952. Foreign consumption, excluding Russia and China, declined from 962,500 tons to 925,000 tons, the first decline to be registered in the postwar period.

Ceylon, meanwhile, has defended its controversial rubber deal with Communist China saying the agreement was made only after negotiations with the U. S. had broken down. The External Affairs Ministry of the British Commonwealth dominion replied to criticism of Ceylon contained in the report to the U. S. Congress by former Mutual Security Administrator W. Averell Harriman.

Mr. Harriman said that Ceylon would not sell to the United States because the Americans refused to pay more than the world market price for the rubber, refused to guarantee the Ceylonese $50,000,000 in economic aid, and balked at cutting the price of rice to Ceylon. The External Affairs Ministry said, however, that it "refuses to accept the blame" for the breakdown in negotiations with the United States.

Urges International Meeting

An international meeting of all elements involved in the Malayan rubber industry was urged recently by the Natural Rubber Bureau to iron out "the current unsatisfactory claim situations, disagreements and misunderstandings which seem to plague buyer, seller and middleman alike." The Bureau said there had been "real accomplishment" by the Malayan Rubber Export Registration Board, set up to watch over quality. While the quality of exports has "improved remarkably" since the board was formed last fall, the Bureau said, further action was necessary.

Among the basic problems to be handled it listed: (1) The adoption by all three elements (buyer, seller and middleman) of a uniform grading system; (2) Agreement on standard contracts to cover each of the common forms of transaction; (3) Agreement on practical packing specifications which can be followed by the eastern shipper; (4) Formation of international arbitration panels.

The Bureau said that the group could be made up "entirely of business elements representing the various geographical and functional groups from each section, but to make it effective the appointed representatives should have plenary powers to speak for their respective trades. "Obviously," it noted, "this is just an idea to be put on the table for discussion, but since the end of the war we have been constantly impressed by the violent recriminations that have been passed back and forth across the waters on the matters mentioned. Surely there must be some means of sitting around a table and getting these disagreements resolved."

On March 6, Malayan rubber dealers accepted the Bureau proposals to meet rubber consumers in New York to discuss "problems resulting from substantial delivery of rubber not conforming to type description and packing specifications." The Federation of Rubber Trade Associations of Malaya is appointing delegates to the meeting suggested by the Crude Rubber Committee of the Rubber Trade Association and the Rubber Manufacturers Association.

New Los Angeles Reclaim Plant

Midwest Rubber Reclaiming Co., East St. Louis, Ill., is building a new reclaim plant in the Los Angeles area. The new plant will use a mechanical method of separating rubber from fiber in scrap automobile tires, a process the company has had under development for some time. Specific capacity details for the new plant have not as yet been released by the company. It has been learned, however, that production is scheduled to start by the year end. The design of the installation will permit rapid expansion if necessary. A new type of reclaim, produced in free-flowing powdered form suitable for automatic handling, is understood to be included in future production plans for the plant. Midwest Rubber recently received a Certificate of Necessity from the Defense Production Administration covering the new facilities.

Plans New Yonkers Factory

Phelps Dodge Copper Products Corp., 40 Wall Street, New York, has assembled a tract of nine acres in Yonkers, N. Y. which will be improved with a branch factory for its subsidiary, the Habirshaw Cable and Wire Corp. Tentative plans call for a one-story structure to contain 350,000 square feet of floor space which will be occupied for manufacturing and office purposes. Habirshaw Cable now has a plant on Point Street in Yonkers.

ONTARIO RUBBER SECTION HEARS TALK BY REMINGTON ON HYPALON

The February 11th meeting of the Ontario Rubber Section of the Chemical Institute of Canada held at Hart House at the University of Toronto in Toronto, Canada, attracted approximately 60 members and their guests. The speaker for the evening was W. J. Remington of the Polychemicals Department, Research Division, of E. I. du Pont de Nemours & Co., Inc. Mr. Remington Spoke on "Hypalon — Chlorosulfonated Polythene."

Mr. Remington said that Hypalon is the outgrowth of a new concept in elastomer technology: that satisfactory elastomers can be developed from chemically saturated materials. Vulcanizates cured with either litharge or magnesia have shown outstanding resistance to attack by concentrated acids and alkalis. Of particular interest is the resistance of the elastomer against such oxidizing agents as chromic, sulfuric, and fuming nitric acids, chlorine dioxide, and sodium hypochlorite. This inertness is accompanied by resistance to degradation at elevated temperatures. Hypalon has remained serviceable almost indefinitely at 125° C., for 10 to 12 days at 150° C. and for 11 hours at 200° C. This unusual durability plus the complete ozone resistance of Hypalon has resulted in outstanding outdoor performance, the speaker observed.

Hypalon is compatible with other common elastomers, and such blends have proven valuable in many commercial applications. For example, white and light colored blends with natural rubber or GR-S have been successful in tire sidewalls, protective jackets for hose and insulated wire, and in boot stocks. Hypalon increases the modulus of Butyl rubber about four-fold when added at a level of only 10%. A 50% blend of Hypalon with buna-N possesses good resistance to both oils and ozone.

The majority of commercial applications are based on the extreme durability of the Hypalon. Acid resistant hose, yellow jacketed mine hose, and garden hose with bright colored jackets are being developed. Solution coatings for improved appearance are giving wear and weather protection to rubber floor mats, automobile window stripping, rubber toys and the like. Conveyor belts coated with white non-toxic Hypalon stocks are expected to find application in food processing plants, the speaker observed.

Other applications for Hypalon under active development include footwear finishes for gloss and ozone protection; coatings for "Orlon" or cotton awnings, convertible tops, and upholstery material; weather resistant sponges for seat cushions and crash pads; refrigerator gaskets; gaskets and closures for aircraft and ships; tire curing bags; and tank lining material, particularly for protection against corrosive liquids and oxidizing agents, Mr. Remington stated.

Manufacturer? Supplier? Consultant? You may be entitled to a listing in the 1953-54 RUBBER RED BOOK. Contact us for information.

Coming Events in the Rubber Industry

Mar. 27. Akron Rubber Group, Spring Meeting, Mayflower Hotel, Akron, Ohio.

Mar. 27. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

Apr. 2. So. Ohio Rubber Group, Engineers' Club, Dayton, Ohio.

Apr. 7. Los Angeles Rubber Group, Hotel Statler, Los Angeles, Calif.

Apr. 9. Northern California Rubber Group, Elk's Club, Berkeley, Calif.

Apr. 10. New York Rubber Group, Spring Meeting, Henry Hudson Hotel, New York, N. Y.

Apr. 15. Washington Rubber Group, PEPCO Auditorium, Washington, D. C.

Apr. 16. Quebec Rubber and Plastics Group in Joint Meeting with S.P.E. and S.P.I., Queen's Hotel, Montreal, Que., Canada.

Apr. 17. Detroit Rubber and Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

Apr. 28-30. Rubber and Plastics Division, A.S.M.E., Columbus, Ohio.

May 1. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

May 5. Los Angeles Rubber Group, Hotel Statler, Los Angeles, Calif.

May 15. Buffalo Rubber Group, International Meeting, Jointly with the Ontario Rubber Section C.I.C., General Brock Hotel, Niagara Falls, Ont., Canada.

May 22. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

May 27-29. Rubber Division, A.C.S., Spring Meeting, Hotel Statler, Boston, Mass.

June 6. So. Ohio Rubber Group, Summer Outing, Inland Recreation Center, Dayton, Ohio.

June 9-11. International Aviation Trade Show, Hotel Statler, New York, N. Y.

June 19. Akron Rubber Group, Summer Outing, Firestone Country Club, Akron, Ohio.

June 19. Boston Rubber Group, Summer Outing.

June 23. Buffalo Rubber Group, Summer Outing.

June 26. Detroit Rubber and Plastics Group, Summer Outing, Hillcrest Golf Club, Detroit, Mich.

June 29-July 3. A.S.T.M., Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

July 24. Chicago Rubber Group, Summer Outing.

Aug. 4. New York Rubber Group, Golf Tournament.

Aug. 22. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Sept. 9-11. Rubber Division, A.C.S., Fall Meeting, Hotel Sherman, Chicago, Ill.

Sept. 17. So. Ohio Rubber Group, Engineers' Club, Dayton, Ohio.

Oct. 2. Detroit Rubber and Plastics Group, Fall Meeting, Detroit-Leland Hotel, Detroit, Mich.

Oct. 6. Buffalo Rubber Group, Hotel Westbrook, Buffalo, N. Y.

Oct. 6. Los Angeles Rubber Group, Hotel Statler, Los Angeles, Calif.

Oct. 16. Boston Rubber Group, Fall Meeting, Hotel Somerset, Boston, Mass.

Oct. 16. New York Rubber Group, Fall Meeting, Henry Hudson Hotel, New York, N. Y.

Oct. 23. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Nov. 10. Los Angeles Rubber Group, Hotel Statler, Los Angeles, Calif.

Nov. 14. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Dec. 11. Boston Rubber Group, Xmas Party, Hotel Somerset, Boston, Mass.

Dec. 11. Detroit Rubber and Plastics Group, Xmas Party, Sheraton-Cadillac Hotel, Detroit, Mich.

Dec. 11. New York Rubber Group, Xmas Party, Henry Hudson Hotel, New York, N. Y.

Dec. 12. So. Ohio Rubber Group, Xmas Party, Miami Valley Country Club, Dayton, Ohio.

Dec. 15. Buffalo Rubber Group, Xmas Party.

Apr. 14-16, 1954. Rubber Division, A.C.S., Spring Meeting, Hotel Brown, Louisville, Ky.

Sept. 15-17, 1954. Rubber Division, A.C.S., Fall Meeting, Hotel Commodore, New York, N. Y.

KITCHENER GROUP HEARS SNYDER SPEAK ON THE CURING PROCESS

The February 10th meeting of the Kitchener Rubber Group of the Chemical Institute of Canada held at the Dominion Tire Office Canteen, Kitchener, Ont., Canada, featured an address by Homer Snyder of the U. S. Rubber Co., Detroit, Mich. Mr. Snyder spoke on "The Curing Process in the Plant and Laboratory." The speaker stated that cure standards are based on initial laboratory slab studies, accelerated service tests and products acceptance in service.

Routine testing of the stocks in cured tires provides a continuing check on the general properties of stocks as they occur in production tires. This method is not suitable for testing special cure features due to stock curing rate variations, Mr. Snyder opined.

Thermocouple studies can be used to study cure features. Knowing the temperature coefficient of vulcanization of the stocks, time-temperature curves can be integrated graphically to give state of cure values expressed as equivalent time at some standard temperature.

Since ordinary Iron-Constantan wire may have response errors of ± 50° F., the thermocouple wire should be specially-selected and calibrated. The leads should follow an isothermal path. Cured tires are used to obtain accurate positioning of the wires. In the center regions of the tire cure values will be approximately 10% low, due to the loss of heat of reaction. Thermocouple studies emphasize the importance of aftercure which can best be controlled by prompt unloading and cooling, Mr. Snyder declared.

Design changes in tire curing presses have steadily reduced the amount of material handling and improved the thermal efficiency. The short cycles of Bagomatic presses are due largely to the thin bag, the speaker noted.

Applying Steam to Mold

External steam can be applied directly to the mold, as in dome type presses, or confined within a jacket or platen. In the platen type press, only the sidewall area of the mold is heated directly, resulting in major temperature drops from sidewall to crown. With the jacket type, these differences are minimized since the crown as well as the sidewall is heated directly, the speaker stated.

Internal heat is supplied by steam or hot water. When steam is used, condensate collects in the lower part of the bag, often causing a major cure difference between the top and bottom sides of the tire. When hot water is used, the flow rate must be high enough to prevent stagnation with accompanying temperature gradients. A balanced hot water system will provide equal flow to all presses.

A small laboratory mold which utilizes tapered pins to provide curing pressure has been developed for precise curing of small samples. The curing is carried out in a constant temperature bath using diethylene glycol as the bath liquid. Temperature regulation is ± 0.2° F. in the range 250-310° F. Samples cured are large enough to be tested for T-50, free sulfur or hysteresis. This curing unit can also be used as a standard for checking regular laboratory curing presses, by curing samples of the same stock in both units and then testing the cured samples by T-50 or free sulfur, he concluded.

MARBON CORP. ANNOUNCES APPOINTMENT OF deSUPINSKI AND CORNELL

B. deSupinski

Bronis deSupinski has joined the laboratory staff of Marbon Corp. as assistant chief chemist. He was formerly associated with Congoleum-Nairn and the Glenn L. Martin Co., where he was active in polymerization and application work on vinyl resins. Mr. deSupinski is a graduate of the University of Pittsburgh and has done graduate work at Johns Hopkins and the University of Maryland.

W. H. Cornell

W. H. Cornell has also joined Marbon Corp. as a group leader, in product development. He will be engaged in the development of adhesives and applications for new resins. Mr. Cornell was formerly with the Henrite Products Corp. where he was in charge of the development of rubber-to-metal bonding methods for vibration dampers, mounting, and other mechanical goods.

New York Plans Spring Meeting

The Spring Meeting of the New York Rubber Group which will be held on April 10 at the Henry Hudson Hotel in New York City is to feature the presentation of three papers by members of the Naugatuck Chemical Division, U. S. Rubber Co. The three papers fall under the general heading of "New Rigid Structural Plastics." Dr. D. L. Schoene, manager of plastics development for Naugatuck Chemical, will deliver a paper on Kralastic molding and extrusion powders. A. M. Stover will deliver a paper on new developments in the rigid vinyl field, and Dr. P. M. Elliott will speak on rigid polyester-glass combinations.

Ft. Wayne Holds Panel Discussion

The Fort Wayne Rubber and Plastics Group held its third meeting of the 1952-53 season on February 5 at the Hotel Van Orman in Fort Wayne, Ind. Approximately 120 members and their guests attended the meeting which featured a panel discussion on "Silicone Elastomers." S. M. Lillis (Victor Mfg.) acted as moderator for the meeting while the panel included the following: P. C. Magner (General Tire), J. E. Martin (Williams Bowman Rubber), G. Konkle (Dow Corning), and J. Deasy (G-E).

High Polymer Group to Meet

The Division of High-Polymer Physics of the American Physical Society will hold its Eleventh Meeting at Durham and Chapel Hill, N. C., on March 26, 27 and 28, 1953, jointly with a meeting of the parent society. A symposium on "Crystallization in Polymers", in which well-known British and American polymer physicists will participate, headlines the program which was arranged by a committee headed by Robert S. Marvin. Raymond F. Boyer has been elected division chairman for 1953, and John D. Ferry, vice-chairman. W. J. Lyons was re-elected secretary-treasurer. Dr. Marvin was elected to a three-year term on the Executive Committee.

Thiokol Club Hears LaQue

The Thiokol Technical Club held an interesting meeting on protective coatings on February 4 at the headquarters of the Thiokol Corp. in Trenton, N. J. Two hundred members and guests came to hear F. L. LaQue of the International Nickel Co. speak on "Some Relationships Between Coatings and Corrosion". Mr. LaQue discussed various aspects of corrosion and related the behavior of protective coatings to basic principles derived from innumerable tests conducted by his company. The technical meeting was preceded by a social hour and a dinner.

Waiting for your copy of the 1953-54 RUBBER RED BOOK? Complete and return all questionnaires quickly! Changes in previously submitted questionnaires will be accepted until May 1.

WASHINGTON GROUP HEARS TALK BY REINSMITH ON TIRE TESTING

Gerald Reinsmith, chief of the Non-Metallic Structural Materials Unit of the Ordnance Corps, Department of the Army, addressed the February 18th meeting of the Washington Rubber Group held in the auditorium of the PEPCO Building in Washington, D. C. Mr. Reinsmith spoke on "Something New in Tire Testing." Mr. Reinsmith shared the program with Dr. Robert D. Stiehler, chief of the Testing and Specification Section of the National Bureau of Standards, and Andrew P. Gregg, an engineer with the same section.

The speaker observed that Army Ordnance spends millions of dollars yearly in the purchase of tires for the Armed Services, and it is desirable that some means be found to evaluate tires in the laboratory and thereby minimize costly "on-the-road" testing.

Mr. Reinsmith described development of a new tire tester which evaluates resistance to flexing fatigue, cut-growth, running temperature, and tread life—all of which heretofore required separate testing. The new device, being developed at the National Bureau of Standards under contract from Army Ordnance, provides the same functions as the present road test and laboratory endurance test combined.

The tester track is 1/60 of a mile in circumference and will accommodate 18 tires simultaneously. It can be regulated to speeds between 22 and 66 miles per hour. Mr. Reinsmith supplemented his report with slide projections and a working model.

Dr. Stiehler took the second phase of the discussion, the design of the tester. He stated that the principal considerations for the size of the track were: (1) to make it as large as possible in order to reduce the effect of track curvatures on the test tires, and (2) to keep it within practical limitations for housing. The shell was made in three sections, each of which weighs 6,000 pounds.

Dr. Stiehler stated that abrasive dust, such as hydrated alumina, had been used to keep abraded rubber from gumming up the surface of the roadway. This dust will also accelerate tire wear, the speaker declared.

The actual details of the engineering of the tester were left to Mr. Gregg for his portion of the program. He described the various mechanical features of the tester including the 6 hydraulic lifts which raise and lower the platform upon which the tires are mounted; the track roadway; track drive; guide wheels; tire mounting; temperature control; ventilation, etc.

Connecticut Hears Kuckro

The Winter Meeting of the Connecticut Rubber Group held on February 20 at the Hotel Barnum in Bridgeport, Conn., was addressed by Gerald Kuckro of the General Electric Co. Mr. Kuckro delivered a very interesting paper entitled "Elastomers of the Future." A full report on the meeting with an abstract of the speaker's paper will appear in the April issue of RUBBER AGE.

Wise Investment

Civil defense is good business. It calls for a small investment of time and energy. The dividends may be nothing less than the preservation of your life, your family, your home, and your property. If you never need what you learn in civil defense, you lose nothing; but if you never learn what you need, you may lose everything. Civil defense is everybody's job. And everybody has a job—an important job—to do. Why not find out from your local civil defense office what your job is?

Akron Holds Panel Discussion

Over 600 members and guests of the Akron Rubber Group attended the January 30th meeting at the Mayflower Hotel in Akron, Ohio, which featured a panel discussion on "Crude Rubber vs. GR-S." Dr. Henry F. Palmer (Kentucky Synthetic) acted as moderator for the symposium. Panel members included A. E. Hosier (Faultless Rubber), C. Boyd Cook (Wooster Rubber), Daniel Reahard, Jr. (General Tire), John E. Brothers (Ohio Rubber), T. A. Riehl (Goodyear), and Harold Niemeyer (Firestone). A full report on the symposium will appear in an early issue of RUBBER AGE. Nine members of the Norwegian Productivity Team were guests of the group. The after dinner speaker was James Schlemmer, sports editor of the *Akron Beacon Journal*, who talked on the "Sports Outlook." D. F. Behney (Harwick Standard), chairman of the Nominating Committee, announced that the following members have been nominated for officers for the 1953-54 season: *Chairman*, R. H. Marston, Jr. (Binney & Smith); *Vice-Chairman*, John E. Brothers and V. L. Peterson (Goodyear); *Secretary*, Andrew Tomlin (Monsanto) and F. W. Gage (Columbia-Southern); *Treasurer*, Harry Brubaker (Witco) and L. A. Anderson (Leverett A. Anderson).

No. California Hears Morrill

The February 12th meeting of the Northern California Rubber Group held at the Elk's Club in Berkeley, Calif., featured an address by Jack Morrill of the Shell Chemical Co. Mr. Morrill spoke on the "Structural Application of Epon Resin." The March 12th meeting of the group, also scheduled to be held at the Elk's Club, was to have featured a talk on "Present and Potential Applications of Silicone Rubber" by Ray Naegele and E. C. Servais of the Silastic Sales Division of the Dow Chemical Co. A report on this meeting will appear in an early issue of RUBBER AGE.

Estimates of production for 1955 and 1975 of synthetic organic chemicals, assembled from the five-volume report of the Materials Policy Commission (June, 1952), are now available in booklet form from R. S. Aries & Associates, 400 Madison Avenue, New York 17, N. Y.

AIEE RUBBER SUBCOMMITTEE PLANS CONFERENCE PROGRAM

The Subcommitte on Rubber and Plastics Industries of the Committee on General Industry Applications, American Institute of Electrical Engineers, will hold a two-day conference on "Electrical Engineering Problems in the Rubber and Plastics Industries" on April 20 and 21 at the Mayflower Hotel in Akron, Ohio. This is the Fifth Conference on this subject sponsored by the subcommittee. A tentative program has been prepared which will include the presentation of the following papers on April 20:

"Power Distribution Layouts for Tire Plants," by James R. Dorsey, B. F. Goodrich Co., Akron, Ohio.

"Fuse and Relay Coordination in Industrial Plants," by Newall A. Williams, Goodyear Tire & Rubber Co., Akron, Ohio.

"Electrical Procedures in Tire Testing Equipment," by Harold Lamb, Adamson United Co., Akron, Ohio.

"Remote Electrical Transmission of Physical Data for Rubber and Plastics Plants," by W. D. MacGeorge, Automatic Temperature Control Co.

"Grounding of Power Systems in Rubber and Plastics Manufacturing Plants," by D. F. Langenwalter and Lewis F. Lewis, General Electric Co., Schenectady, N. Y.

The following papers have been prepared for presentation on April 21:

"Servo Mechanisms—Automatic Feedback, Practical Applications," by Charles M. Edwards, Bendix Research Laboratories.

"Current Limit Power Fuses for High Interrupting Capacity Controllers," by C. Colby, Firestone Tire & Rubber Co., Akron, Ohio.

"Atomic Power for War and Peace," by R. J. Kryter, Esterline-Angus Co., Inc.

In addition to the presentation of papers, an inspection trip through the main plant of the B. F. Goodrich Co. in Akron has also been planned.

Detroit Holds Panel Discussion

A panel discussion on "Automotive Adhesives" featured the February 13th meeting of the Detroit Rubber and Plastics Group which was held at the Detroit Leland Hotel in Detroit, Mich. J. T. O'Reilly (Ford) acted as moderator. Panel members, all of whom delivered short talks, included Sam Adinoff (St. Clair Rubber), C. L. Stachel (U. S. Rubber); Gordon Lindner (Minnesota Mining), Dr. A. Carter (Chrysler), and John Clark (Packard). A full report on this meeting will appear in an early issue of RUBBER AGE.

Schwab Opening New Plant

Formal opening of the new plant and general offices of the Schwab Rubber Co., Inc., and the Schwab Latex Co., Inc., has been set for March 23, with ceremonies starting at 2:00 P.M. The new plant, which has seven full stories, is located at Riverside Drive and 134th Street in New York City. The Schwab Latex Co. is one of the largest distributors and fabricators of Goodyear Airfoam.

SYMPOSIUM ON RUBBER MOLDING WILL FEATURE ASME MEETING

A Symposium on Industrial Rubber Molded Products will be a highlite of the two-day meeting to be held by the Rubber and Plastic Division of the American Society of Mechanical Engineers at the Deshler-Wallick Hotel in Columbus, Ohio, on Tuesday and Wednesday, April 28 and 29. The meeting will be held jointly with that of the parent society.

The rubber symposium, which will be held on Wednesday morning, April 29, will feature three papers, as follows: "Progress in Manufacturing Methods in the Molded Rubber Products Industry," by J. H. Gerstenmaier, Manager, Development Department, Goodyear Tire & Rubber Co., St. Marys, Ohio; "Product and Mold Designing for Lower Ultimate Cost," by John K. Mason, Manager, Sales Engineering, Firestone Industrial Products Co., Noblesville, Indiana, and "New Product Engineering," by Howard H. Armstrong, Design Engineer, Mechanical Molded Products Division, B. F. Goodrich Co., Akron, Ohio. A paper on "Mechanical Properties of High Mooney Elastomers," by Merle Sanger and Paul Earley, General Tire & Rubber Co., Akron, Ohio, will also be presented at this session.

Sessions on plastics will be held on the morning and afternoon of April 28. The morning session will feature the presentation of the following papers: "Teflon—Its Properties and Uses," by L. W. Cornell, Minnesota Mining & Manufacturing Co., St. Paul, Minn.; "Unplasticized Polyvinyl Chloride—The Dawn of a New Era in Corrosion Protection," by George S. Laaff, Bolta Co., Lawrence, Mass., and "Metal-Clad Laminates Used in Printed Circuitry," by Norman A. Skow, Synthane Corp., Oaks, Penna.

The afternoon session will feature these papers: "Reinforced Plastics Connector Rings and Bolts for Fastening Timbers," by H. A. Perry, Jr., Naval Ordnance Laboratory, Silver Spring, Maryland; "Reinforced Plastic Laminates for Aircraft use," by Capt. D. Rosato, Wright Air Development Center, Dayton, Ohio, and "The Navy Looks at Structural Plastics," by W. H. Graver, Bureau of Ships, Washington, D. C.

Among those who will serve as chairmen and vice-chairmen at the various technical sessions will be: Dr. William Hedges (Columbus Coated Fabrics), Charles M. Fields (Shellmar Products), Dr. Robert I. Laininger (Battelle Memorial Institute), C. B. Jones (Structurlite Plastics), Stewart Brams (Dayton Chemical Products), and Dr. Stephen Palinchak (Battelle Memorial Institute).

The American Society of Mechanical Engineers welcomes all technical people to their meetings. No charge is made to members of the society but a $5.00 registration fee is charged to non-members. Allen Gifford, of the Lord Manufacturing Co., Erie, Penna., is secretary of the Rubber & Plastics Division.

Waiting for your copy of the 1953-54 RUBBER RED BOOK? Complete and return all questionnaires quickly!

Mason Named Research Director

James N. Mason

James N. Mason has been appointed to direct research and development for the Boston Woven Hose & Rubber Co., Boston, Mass. Well known in the rubber industry and allied fields, Mr. Mason, prior to his new association was the executive vice-president of the Coated Products Division, Interchemical Corp. From 1942 to 1949 he was with the O'Sullivan Rubber Corp. of Winchester, Va., serving consecutively as superintendent, plant manager, vice-president, executive vice-president and a director. He has also been associated with the Quabaug Rubber Co., North Brookfield, Mass., and the Victor Reclaim Products Corp., Hagerstown, Md. Born in Brockton, Mass., Mr. Mason attended Bowdoin College, Brunswick, Maine.

Outcault Announces Retirement

St. Joseph Lead Co. has announced that Harry E. Outcault, manager of zinc oxide sales, has exercised the early retirement privilege under the company's retirement plan for salaried employees. In view of Mr. Outcault's retirement, the Zinc Oxide Sales Department has been consolidated with the Metal Sales Department. Charles R. Ince, vice-president and manager of metal sales, has become vice-president and sales manager. Malcolm Bonynge and Dwight Marshall will continue as assistant sales managers in the Metal Sales Department and Robert H. Crossley will become assistant sales manager in charge of zinc oxide sales. Under the above consolidation, no changes in sales outlets or methods of distribution are contemplated, the company announced.

Forms Resin Specialty Department

Advance Solvents & Chemical Corp., New York, N. Y., has announced the formation of a Resin Specialty Department under the direction of Dr. Werner R. Husen. Production of this new group of specialty synthetic resins, according to the company, rounds out its complete line of driers, stabilizers, plasticizers, wetting agents and fungicides. Dr. Husen invites inquiries for specialty resins, which, he notes, are best produced in custom control batches.

DUPONT TRIAL CONTINUES AS COURT DROPS 36 DEFENDANTS

The government's anti-trust suit against E. I. du Pont de Nemours & Co., Inc., General Motors Corp., U. S. Rubber Co. and three lesser corporations was resumed in Federal District Court in Chicago on February 16 after having been recessed since January 20 when the government rested its case. At a special hearing on February 11, Judge Walter J. La Buy, dismissed "without prejudice" thirty-six members of the du Pont family. The dismissal left thirty-three du Ponts still parties to the case, in which the government wants the court to order DuPont to divert itself of interest in General Motors and U. S. Rubber.

On February 17, testimony was heard from Pierre and Irenee du Pont. Both denied that they had set up holding companies to perpetuate their family's interest in the DuPont company. Government attorneys had previously charged that the du Ponts set up the Delaware Realty and Investment Corp. and the Christiana Securities Co. as holding companies.

Later, on February 24, Pierre du Pont defended the use of a stock bonus plan for executives of DuPont affiliates and subsidiaries as "a good thing". The government charged that the du Pont interests took over control of General Motors after acquiring large blocks of stock in the concern after World War I. It charged also that the stock bonus plan to General Motor's executives was instituted to make these officials subservient to du Pont interests.

As the trial progressed it was understood that Charles E. Wilson, former president of General Motors, and now Secretary of Defense, would be called to testify. Defense counsel said that Alfred P. Sloan, Jr., chairman of the board of General Motors, would also be called to testify as would Charles F. Kettering, General Motors' research consultant.

Other news came from a minority stockholders group in DuPont which is expected to introduce a resolution at the company's annual meeting on April 13 in Wilmington, Del., to "consider a compromise of certain litigation with reference to the pending anti-trust suit against the company." The DuPont management is reported to be strongly opposed to any compromise in the matter.

Elastomer Chemical Moves Offices

Elastomer Chemical Corp. of Nutley, N. J. has moved to larger premises at 212 Wright Street, Newark 5, N. J. Henry E. Allen, vice-president, announced that increasing demands for the special vinyl plastisol compounds Elastomer Chemical manufactures necessitated the move. Elastomer Chemical recently developed a unique foamed plastisol based on vinyl resins for which many new applications in various industries have been found. Expanded facilities at the new plant will enable Elastomer Chemical to continue research and development of new materials and at the same time improve existing products and customer service.

Wyrough and Loser Formed

George J. Wyrough and Thomas N. Loser have announced the formation of a new partnership to be known as Wyrough and Loser to represent manufacturers of chemicals, raw materials and processing aids for the rubber, plastics, floor covering, paper and paint industries. The new company will maintain offices at 801 Broad Street Bank Building, Trenton, N. J. The telephone number is 9-2531. Mr. Wyrough is a graduate of Pennsylvania State College and has had many years of experience in the rubber industry as chemist, factory manager and technical sales representative. During World War II, he served as a member of the Government Technical Committee of the Rubber Mechanical Goods Industry and as a member of the Technology Committee of the National Synthetic Rubber Corp. Mr. Wyrough also served as a member of the Mechanical Goods Technical Committee of the Rubber Manufacturers Association for eight years. He is chairman of the Philadelphia Rubber Group and past-chairman of the New York Rubber Group.

Mr. Loser is a graduate of Wesleyan University and a veteran of four years service with the U. S. Navy as a lieutenant. Since his discharge in 1945, he has acted in a sales capacity for several raw material and chemical firms, the last four years as Eastern sales manager of the Calcium Products Division of the Georgia Marble Co. Miss Mary Jane Dilts, formerly associated with the H. N. Richards Co., has been named office manager of the new firm which numbers among its accounts the Georgia Marble Co., Cooke Color & Chemical Co., Haven Chemical Co., Lukens, Inc., and after April 1, the Naugatuck Chemical Co.

Recent Schrader Appointments

Richard C. Maxwell has been appointed Los Angeles manager of A. Schrader's Son, Division of the Scovill Manufacturing Co., Inc. Mr. Maxwell joined the firm in 1947 as representative in the southeastern states. In his new position, he will be in full charge of the Los Angeles office and warehouse, and of manufacturers' sales on the West Coast. Clarence M. Huffman, associated with Schrader since 1933, has been appointed manager of accessory sales for the Pacific Coast Branch of the division. William C. Clen-Dening, long associated with the advertising field, has joined the division as special assistant to Garvin A. Drew, general sales manager and assistant vice-president. His duties will be to coordinate advertising, sales promotion, display and merchandising efforts of the various sales departments. John Hoerger, formerly Pacific Coast manager of the division, has retired. He joined Schrader in 1914.

Buxbaum Receives RFC Loan

Under authorization of the Defense Production Act, the Reconstruction Finance Corporation has approved a loan of $175,000 to the Buxbaum Co. of Canton, Ohio. The loan will be used by the rubber company for machinery and equipment.

Yule Joins A. Schrader's Son

George G. Yule

George G. Yule has joined A. Schrader's Son, Division of Scovill Manufacturing Co., Inc., as special representative with headquarters at the Brooklyn, N. Y., office. Mr. Yule, a graduate of Yale University in 1914, became associated at that time with the experimental and engineering departments of one of the major rubber companies. This phase of experience was interrupted by World War I when he enlisted and became a balloon observer in the Army Balloon Corps. After the war he continued in the rubber industry for a number of years and later entered the real estate development field. During World War II, Mr. Yule was a member of the War Production Board and has since filled various executive positions for the government with the War Assets Administration, Controlled Materials Plan and National Production Authority.

Corduroy Rubber Elects Officers

Roy C. Murphy, formerly executive vice-president of the Corduroy Rubber Co., Grand Rapids, Mich., has been elected president of the company succeeding the late L. A. Brown. Mr. Murphy joined the company in 1921 and was elected a director of the company in 1929. In 1931 he became executive vice-president and in 1943 was named treasurer and general manager. Charles E. Mills, previously factory manager of the company, has been elected a vice-president and a director. Malcolm S. Bonney, director of purchases, was elected treasurer. The above named constitute the board of directors together with Leo B. McCourt and Joseph Stevens. Mr. McCourt is sales manager of the Tire and Tube Division of the company.

Advance Solvents Names Anderson

Advance Solvents and Chemical Corp. announces the appointment of Wayne F. Anderson as representative for rubber and plastics chemicals in northern Ohio, with offices at 547 Aqueduct Street, Akron. Mr. Anderson has been associated with the vinyl plastics industry since 1941, and prior to the recent formation of his own sales organization, served as sales representative for the B. F. Goodrich Chemical Co. in northern Ohio and Michigan.

Named Field Crop Research Head

Dr. Martin G. Weiss has been named research director of field crops in the Bureau of Plant Industry, Soils and Agricultural Engineering, the U. S. Department of Agriculture announced recently. The position has been vacant since Dr. W. M. Myers resigned in June, 1952, to take charge of the work in agronomy and plant genetics at the University of Minnesota. Dr. Weiss had been in charge of soybean improvement investigations in the Bureau. In his new position Dr. Weiss will be responsible for planning, coordinating, and managing activities in production research on cereal crops and diseases, cotton and other fiber crops and diseases, forage crops and diseases, rubber plant investigations, sugar plant investigations, tobacco, medicinal, and special crops, and weed investigations. Dr. Weiss, 41 years of age, is a native of Muscatine, Iowa. He joined USDA as a junior geneticist in May 1936 while a graduate student at Iowa State College. Dr. Weiss served in the European theatre during World War II. In 1946 he returned to Iowa State College as research professor and professor of farm crops. He also conducted graduate training in plant breeding and directed plant breeding research in forage crops. He was named project leader in soybean investigations for the Bureau of Plant Industry, Soils, and Agricultural Engineering in 1950. For the present he will continue to direct the soybean project in addition to his new duties. Dr. Weiss is a member of the American Society of Agronomy, the Genetics Society of America, the Soybean Association, and Sigma XI. He holds a colonel's rank in the U. S. Air Force.

Goodyear Names Two Managers

Two new assignments in the Purchasing Department of the Goodyear Tire & Rubber Co. have been announced by Mark W. Laibe, director of purchases. Charles R. Howard has been named manager of the Engineering Section of the Purchasing Division and V. L. Petersen, manager of the Chemical and Pigment Section. Mr. Howard has been affiliated with Goodyear's Purchasing Division at Akron since 1938 when he was transferred from the company's Windsor, Vt. plant. A graduate of Middlebury College, he joined Goodyear-Windsor in 1936. Petersen, a native of Massachusetts and a graduate of Worcester Polytechnical Institute, came to Goodyear in 1947 and has been affiliated with the Purchasing Division since January, 1948.

Witco Promotes John Wishnick

John H. Wishnick, formerly manager of the Chicago plant of Witco Chemical Co., has been placed in charge of chemical manufacturing at the Chicago and Brooklyn plants. Mr. Wishnick graduated from the University of Oklahoma in 1948 and came to Witco as a petroleum engineer for the Continental Carbon Co. Joseph Tumpeer, sales manager of the Asphalt Division, has assumed charge of the manufacturing operations at Lawrenceville, Illinois, and Perth Amboy, New Jersey.

LABOR DEPARTMENT REPORTS ON RUBBER INDUSTRY 1952 RECORD

Violations of the overtime pay provisions of the Fair Labor Standards Act were the chief cause last year of back wage liabilities for firms in the rubber products industry, according to the 1952 annual report of the U. S. Labor Department's Wage and Hour and Public Contracts Divisions. The report, recently released by Administrator William R. McComb, shows that employers in the industry paid $23,716 in back wages to 597 employees as a result of the Divisions' activities. This sum does not include amounts awarded to employees who sued in court for back pay and liquidated damages.

Of the 132 establishments investigated by the Divisions during fiscal year 1952, 55 percent were found in violation of the overtime pay requirements. Thirteen percent had failed to comply with the statutory minimum wage. The Divisions found violations of the Act's child-labor provisions in 9 percent of the investigated establishments. This record—and the fact that 63 percent of the investigated establishments had violated one or more of these basic provisions of the Federal Wage and Hour Law—should not be considered representative of compliance by the rubber products industry as a whole, however.

The Divisions' policy is to make investigations on a selective basis. Efforts are concentrated where complaints have been made or general information indicates that violations will probably be found. Only a small proportion of those establishments having employees covered by the law are investigated.

"These findings should remind all employers in the rubber products industry to make 'sure they are complying with the Act," Administrator McComb commented. "Most violations were due to mistaken ideas about the Wage and Hour Law's applicability to some of the establishment's employees. Complete understanding on the status of every employee would eliminate the chance of having to make unexpected back wage payments."

"Fabrilite" Elastic Upholstery

An upholstery sufficiently elastic to shape around hard-to-tailor curves without folding or pleating is being introduced by the Fabrics Division of E. I. du Pont de Nemours & Co., Inc. Designated as "Fabrilite" elastic-supported, vinyl plastic upholstery, the new material has, according to DuPont, already won favor in the automotive industry and is being adopted by furniture manufacturers on contour chairs and other pieces presenting curves difficult to fit. Since this type of "Fabrilite" is backed by a knit fabric which is elastic in nature, DuPont claims, the upholstery will not become baggy or sag. The plastic is formulated to maintain the original pliability for many years under extreme conditions of service. It is said to have resistance to stiffening from perspiration, body oils, cracking, scuffing and abrasion. Elastic "Fabrilite" comes in a high-style, burnished antique leather effect, 52 inches wide. Thirteen colors are available.

Lee Promoted by Goodyear

Walter J. Lee

Appointment of Walter J. Lee as manager of tire development and compounding at the Goodyear Tire & Rubber Co., to succeed Walter W. Vogt, who has asked to be relieved of that responsibility for reasons of health, was recently announced. Mr. Lee has been general manager of Goodyear's Rim Division. Mr. Vogt will assume special technical duties as assistant to R. P. Dinsmore, vice-president in charge of development and research. Hilton J. Lafaye, sales manager of Goodyear's Rim Division since 1951, has been named general manager of the company's Metal Products Division (formerly the Rim Division). Mr. Lee, who joined Goodyear in 1922, following graduation from Cornell University, completed training in the company's squadron in 1925 and was transferred to tire design, where he remained until 1937, when he was appointed assistant superintendent of the Goodyear-Java plant. He was returned to Akron in 1939 to head the Truck Tire Design Department until 1942, when he was named technical contact man in the company's Manufacturers' Sales Division. He was Detroit resident engineer beginning a year later and in April, 1951, was appointed assistant general manager of the Rim Division. In 1952 he was named general manager of the Rim Division.

Crosley Votes Aerojet Merger

Directors of Crosley Motors, Inc., Cincinnati, Ohio, voted on February 26 to merge with the Aerojet Engineering Corp. of Azusa, Calif. General Tire & Rubber Co. owns controlling interest in both concerns. The new company would be known as the Aerojet General Corp. The Cincinnati Division would manufacture metal parts for jet-assisted take-off rockets. The propellants for the rockets would be loaded at Aerojet plants in Azusa and Sacramento, Calif. Aerojet Engineering is said to be the largest commercial developer of rocket components and propellants and has a defense order backlog of $100,000,000, according to a recent company statement. It was announced that a capital expenditure of $300,000 to $400,000 would be necessary to equip the Crosley plant for production of the metal parts of the rocket.

S. L. ALBERT ASSUMES CONTROL OF SEIBERLING LATEX PRODUCTS

Sydney L. Albert, president of L. Albert & Sons, Akron, Ohio, has assumed control of the Seiberling Latex Products Co. of Barberton, Ohio. Mr. Albert, who offered to pay $565,680 for the company's 12,132 shares of outstanding stock, is virtually assured of 98% of the stock. Mr. Albert had deposited the money in an escrow account at the First National Bank of Akron. The 142 owners of the three issues of stock were invited to send their certificates there for redemption.

From all indications, Mr. Albert is expected to wind up with all but 36 of the 1,452 shares of 6% preferred stock and all but 216 shares of the 10,045 shares of common. He already has the entire 635 shares of 6% prior preferred stock. Mr. Albert's offer hinged on one condition—that stockholders agree to sell him at least 67% of each of the three issues by February 4.

Purchase of the stock gives Mr. Albert the Barberton and New Bremen, Ohio plants of Seiberling Latex. He has also acquired the Jasper Rubber Co. of Jasper, Ga. in a separate deal. Jasper Rubber produced rubber goods for Seiberling Latex. Mr. Albert said it was his intent and desire to use the Barberton facilities for production purposes if at all possible.

The Barberton factory has 98,000 square feet of floor space and is located on 19.9 acres of land. It has been virtually shut down in recent months. Operations at New Bremen have been continued almost at capacity.

Resignations of present officers and directors of Seiberling Latex headed by president T. K. Seiberling have already been drafted. They will become effective as soon as details of the transaction have been completed.

Carbide & Carbon Promotes Two

H. D. Hughes has been appointed general sales manager and E. E. Fogle, sales manager, of the Industrial Chemicals Division, Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp. The announcement marked the return to the company of Mr. Fogle who has been on a seven-month leave of absence as director of the Rubber, Chemicals, Drugs, and Fuel Division of the Office of Price Stabilization. Both Mr. Hughes and Mr. Fogle are veteran chemical salesmen, Mr. Hughes having joined the sales department of Carbide and Carbon Chemicals Co., in 1928. For four years before that he was with a sister company in U.C.C., the Linde Air Products Co. In 1942 and 1943, Mr. Hughes was Director of the Commodities Bureau, War Production Board in Washington. He became sales manager of the Industrial Chemicals Division in 1945. In his new position, Mr. Hughes will co-ordinate the sales activities of the company's district sales offices. Mr. Fogle joined Carbide and Carbon Chemicals Co. through its research fellowship at Mellon Institute, Pittsburgh, in 1930. He became Cleveland district sales manager in 1940, western division sales manager in 1944, and assistant sales manager of the Industrial Chemicals Division in 1947.

Sees Increased Tire Business

The business outlook for the nation's tire industry is more optimistic now than at any time since the end of World War II, Howard N. Hawkes, vice-president and general manager of the Tire Division, said recently at the convention of the National Automobile Dealers Association in San Francisco, Calif. More than 91,000,000 passenger car, truck and bus tires will be sold in the nation during 1953 and it will tax the production capacity of the industry to meet this demand. The figure represents an increase of approximately 12 per cent compared to sales in 1952. Approximately 33,000,000 tires will be sold to automotive manufacturers and 58,000,000 tires will be sold to the nation's motorists for replacement use. The motoring minded West Coast, he pointed out, will buy approximately 8,100,000 passenger car, truck and bus tires in 1953 compared to 7,300,000 in 1952. It has about 10 per cent of the nation's population, yet it will buy about 14 per cent of the replacement tires sold this year. Discussing additional new developments, Mr. Hawkes said U. S. Rubber is working experimentally with the new synthetic rubber "Vulcollan." Experimental tires with treads made of this new rubber are wearing as long as 100,000 miles, he said.

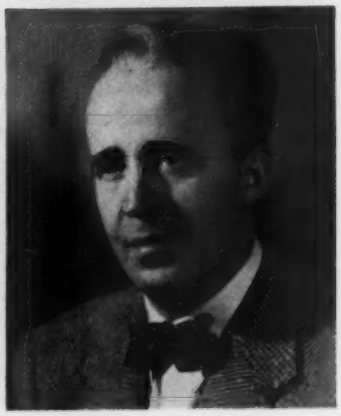
Receive Management Awards

Six rubber companies have been awarded Certificates of Management Excellence by the American Institute of Management, New York, N. Y. Those so recognized include: Firestone Tire & Rubber Co., B. F. Goodrich Co. and Goodyear Tire & Rubber Co., all of Akron, Ohio; Minnesota Mining & Mfg. Co., St. Paul, Minn.; Raybestos-Manhattan, Inc., Passaic, N. J., and U. S. Rubber Co., New York, N. Y. The last named obtained the A. I. M. award for the first time; the others for the third consecutive year. According to Jackson Martindell, president of the Institute—a non-profit foundation devoted to improvement of corporate policies and practices—only 330 companies in the United States and Canada, out of the 3,000 leading concerns whose methods were studied by the Institute, were found eligible to receive the designation.

Elected President of Givaudan

At the annual meeting of the board of directors of the Givaudan Corp., E. R. Durrer was elected president of the company and its affiliate companies, Givaudan-Delawanna, Inc., Givaudan Flavors, Inc., Sindar Corp. and Givaudan-Foreign, Inc. Mr. Durrer succeeds Dr. Eric C. Kunz, who had retired from the active management of the company in 1947 when Mr. Durrer assumed the executive management in his capacity as executive vice-president. The other officers elected by the board are: F. N. Bangs, vice-president and secretary; H. F. Duffy, treasurer; Max Luthy, vice-president in charge of production and research; and R. E. Horsey, vice-president in charge of sales. R. E. Vicklund continues as manager of sales and development of the Sindar Corp.

Mueller Opens Consulting Office



Dr. Hans J. Mueller

Dr. Hans J. Mueller has opened a new office as a consulting chemist and engineer at 451 Deming Place, Chicago 14, Ill. Dr. Mueller received his early training in Germany and obtained his Ph.D. in 1929 at the University of Giessen. He was connected with the Continental Rubber Works in Germany for seven years. In 1937, Dr. Mueller came to the United States. From that year until 1940 he was associated with the Goodyear Tire & Rubber Co. In later years, he was associated with Stokes Molded Products, Inc., the Thermoid Co., Faultless Rubber Co., Lord Manufacturing Co., Airlastic Rubber Co., and other concerns. In all, Dr. Mueller has over 24 years experience in the rubber industry and related fields. In the near future he plans to install mixing, curing and testing equipment for the convenience of his clients.

AICE Akron Section Officers

Archie B. Japs, director of chemical engineering research at the Research Center of the B. F. Goodrich Co., Brecksville, Ohio, has been named chairman of the Akron Section of the American Institute of Chemical Engineers for 1953. He succeeds John W. Kosko (Goodyear). Paul M. Lindstedt, manager of the Chemical Engineering Division for Goodyear, has been named vice-chairman. Walter M. Otto, manager of the synthetic rubber pilot plant for the Firestone Tire & Rubber Co., was named secretary. Harold L. Nicholson (Ohio Match) is treasurer of the Section. All the officers, together with Mr. Kosko, will serve as the organization's Executive Committee.

Rome Cable Calls Preferred

All of Rome Cable Corporation's outstanding 4 per cent cumulative convertible preferred stock has been called for redemption at $31.29, the company has announced. The redemption date is March 25 with the Guaranty Trust Company of New York as agent. On or before March 24, holders can convert the preferred stock into common stock at a rate of 1.59 shares of common for each share of preferred held.

Goodyear-URW Sign New Accord

Goodyear Tire & Rubber Co. and the United Rubber Workers, C.I.O., signed a new contract on February 28 which will be in effect until February 10, 1955. The new contract covers every feature except wages and has twenty-five "basic improvements" including triple time for work on six paid holidays. The contract must be ratified by ten locals before it goes into effect. L. S. Buckmaster, URW president, said the contract provides a clause permitting wages to be discussed after thirty day's notice. The union's International Policy Committee was scheduled to meet on March 13 and 14 in Cleveland, Ohio, to decide on what the rubber industry would be asked in the way of wages. The new contract calls for two-weeks vacation after three years' employment. Previously, this had not been granted until after five years. Other features of the new contract that were liberalized were in severance pay, leaves of absence and safety and health provisions. The union now is negotiating with the General Tire & Rubber Co. in Cleveland, while talks with the U. S. Rubber Co. began in New York on March 2. B. F. Goodrich Co. and the Firestone Tire & Rubber Co. have contracts that do not expire until next year.

New Hospital Sheeting Standard

A meeting of the industry and representatives of hospitals is to be held at the National Bureau of Standards, Thursday, March 19, 1953, to consider revision of Hospital Sheeting for Mattress Protection, Commercial Standard CS114-43, the Commodity Standards Division, U. S. Department of Commerce, announced recently. The present edition of the Commercial Standard was adopted by the industry in 1943. It applies to fabrics made waterproof by rubber or rubberlike plastic materials impregnated or coated on the fabric. The standard is widely used by hospitals in the proceurement of protective sheeting for mattresses. The meeting on March 19 will consider a proposal to expand the scope of the Commercial Standard to include unsupported types of sheeting—those in which no fabric is employed—made of tough plastic materials of recent development. All interested firms, organizations and hospitals are invited to send representatives to the meeting. Those who wish to attend the meeting should write to F. W. Reynolds, Commodity Standards Division, O.I.C., Washington 25, D. C., for further details and a copy of the proposal under consideration.

Columbia Rubber Mills Formed

Columbia Rubber Mills has been formed at 12022 S. E. Powell Blvd. in Portland, Ore., for the manufacture of gaskets, bushings, washers, rolls, tank linings and hand truck wheels. According to the new firm, facilities for the production of other items will be installed at a later date. Alcwyn Jones, formerly associated with Huntington Rubber Mills, Inc., is president of the new concern. Other officers include Carl Sandness, vice-president, and Charles B. Neal, secretary.

Pratt Elected Vice-President

D. M. Pratt

The election of D. M. Pratt as vice-president and sales manager of the Marbon Corp. was recently announced. Mr. Pratt joined Marbon in 1934 as a laboratory technician. Following this, he went into sales work and became sales manager in 1946. Prior to coming with Marbon, Mr. Pratt was associated with the Goodyear Tire and Rubber Co. and for a time was sales representative for Herron Bros. and Meyer, Inc. Mr. Pratt is a graduate of the Oberlin School of Commerce in Oberlin, Ohio. He is a member of the Rubber Division of the American Chemical Society, the Chicago Rubber Group and the Gary Chamber of Commerce.

Court Finds Shaver Guilty

Charles E. Shaver, former counsel of the Senate Small Business Committee, has been fined $1,000 and drew a suspended prison sentence for accepting money to influence Reconstruction Finance Corp. loans. United States District Judge Charles F. McLaughlin sentenced Mr. Shaver to eighteen months to two years imprisonment but suspended it. Mr. Shaver pleaded guilty to accepting three payments of $500 each from companies seeking R.F.C. loans while he was working for the small business committee in 1950-1951. A Federal law makes it a crime for a government employee to accept money in connection with matters before any government agency.

Synthetic Apparel Labeling Bill

A bill authorizing the Federal Trade Commission to require labeling of clothing and some other products containing synthetic rubber has been introduced by Representative James C. Davis (Dem., Ga.). The bill would require labeling "all articles of wearing apparel and all articles intended for personal use in frequent or sustained contact with the skin" which include any synthetic rubber. A similar measure, covering a wider group of products, was introduced by Mr. Davis in the last Congress, but was pigeonholed by the House Commerce Committee. The same committee has received the new bill.

Recent Goodyear Appointments

Robert C. Case, formerly technical superintendent of the Gadsden, Ala. plant of the Goodyear Tire & Rubber Co. has returned to Akron to assume new duties as chief engineer of the Tire Design Division of the company. M. H. Laatsch, chief chemist at Gadsden, moves into the post vacated by Mr. Case; and J. L. Ryan, formerly assistant chief chemist, moves into Mr. Laatsch's old position. At the same time, R. R. Adams was named manager of technical service at Gadsden. Mr. Case has been affiliated with Goodyear since 1933 and has been technical superintendent at Gadsden since Sept., 1950. He joined the company as a member of the production training squadron and has specialized in tire development and design work. During the war he was loaned by Goodyear to the War Production Board as a tire technician. Born at nearby Randolph, Ohio he is a graduate of Ohio Northern University.

Mr. Laatsch has served at Gadsden as chief chemist since March 1, 1951, going there from the Goodyear Fabric Corp. at New Bedford, Mass., where he held the technical superintendent's post. From 1938, when he joined Goodyear, until he was assigned to his New Bedford duties in 1947, Mr. Laatsch had been employed in Akron. Mr. Laatsch, a native of Somerset, Kentucky, is a graduate of Alabama Polytechnical Institute, and he took advanced work at the University of Akron. Mr. Ryan went to Gadsden as assistant chief chemist in 1952 from Goodyear's Los Angeles plant, at which he began his company service in 1941. Native of Omaha, Neb., he is a graduate of St. Marys College in California, taking advanced work at California State College. Mr. Adams joined Goodyear in 1943 following his graduation from Ohio University as an industrial engineer. He served in Akron until December of last year when he was transferred to Gadsden.

Plans New Research Center

U. S. Rubber Co. has signed a conditional purchase contract for approximately 80 acres of land in Emerson, New Jersey, on which it plans to create a new research center devoted to basic research in the fields of rubber, chemicals, synthetics, textiles, and plastics. The purchase price was not disclosed. "In its initial phase, this new center will house fundamental research activities," according to H. E. Humphreys, Jr., president of the company. "Research activities at the existing Passaic laboratories will be continued." The buildings will be constructed in line with latest architectural design, according to company officials, and the exterior will suggest a modern university in appearance. The first building will have the most modern features and research facilities available anywhere. Construction is expected to begin this year, and the center will open with an initial employment of about 125. Eventually, it is expected this number will be nearly trebled. U. S. Rubber's new research center will be about 12 miles from the existing General Laboratories at Passaic, which will continue in operation.

Farr Joins Emery Industries

John D. Farr

Emery Industries, Inc., announces the appointment of John D. Farr to their Development and Service Department. Mr. Farr, a chemical engineering graduate of the University of Illinois, has had considerable experience in vinyl plastics and synthetic rubbers with the B. F. Goodrich Co., at both their Akron and Marietta, Ohio, plants. In his new capacity, Mr. Farr will be concerned with all development and technical service activities pertaining to Emery's Plastolein Plasticizers.

Goodrich Buys I. T. S. Business

B. F. Goodrich Co. has bought the assets and business of I.T.S. Co. of Elyria, Ohio for an undisclosed amount. F. A. Lang, general manager of Goodrich's Shoe Products Sales Division, said the entire line of I.T.S. heels and soles has been added to the Goodrich line of shoe products. The I.T.S. company makes "Tuffy" heels and soles and is said to have introduced the first concave, convex rubber heel for the shoe repair industry. Production of its products will continue to be centered at the Goodrich Clarksville, Tenn., plant, where I.T.S. heels and soles have been made for many years. Mr. Lang also announced a revision of his field sales organization to include several members of the I.T.S. selling organization. Under the new setup, five field sales supervisors will be established at Akron, Atlanta, Los Angeles, New York and St. Louis to handle the sale of Goodrich and I.T.S. products.

Hersman Mold Incorporates

The Hersman Mold & Machine Co., Akron, Ohio, has been incorporated with 250 shares of no par stock. Hunter J. Hersman, who founded the company in 1947 and who has been the sole owner, is president of the new corporation. The company has 25 employees engaged in making rubber molds, machinery and precision dies. Edward I. Abramson, Robert E. Shuff and William F. Kuehnling are named as incorporators in the papers filed with the Secretary of State at Columbus, Ohio.

Sun Announces Fall Line

Sun Rubber Co., Barberton, Ohio, has launched its 30th Anniversary with the introduction of its 1953 "Sunbabe" fall line of rubber, latex and vinyl dolls. Two of the new numbers this year are "Bob" and "Bobbie", a new set of twin boy and girl dolls with latex bodies. Also included in the line are three complete doll sets. The dolls themselves feature rubber bodies and vinyl heads while the entire set includes a complete sewing kit, and assorted clothes and materials for the young seamstress. Another of the features of the new Sun line is the vinyl group, featuring dolls which are warm to the touch and which will not fade or darken. Sun also offers a complete line of drinking, wetting and sleeping dolls and an unusually wide group of items in the inflated rubber character dolls and toys, wheel toy and animal groups. Completing the line is a wide assortment of sports and athletic ball goods. The processes and apparatus by which all Sun vinyl toys and dolls are manufactured are covered by U. S. Patent Numbers 2,629,131 and 2,629,134, issued to the company on February 24, 1953.

Jenkins Joins A. Schulman, Inc.

James W. Jenkins has dissolved his rubber brokerage firm, J. W. Jenkins & Co., to accept a position with the New York office of A. Schulman, Inc. Mr. Jenkins began his career in the rubber industry with A. Schulman 16 years ago after attending Akron University. He spent three and one half years with the 36th Infantry Division during the war serving in North Africa, Italy, France and Germany and winning the Bronze Star Medal and six battle stars. Following his discharge from the Army he traded in rubber and plastic materials and in 1950 formed his own company which had offices at 10 N. Main Street in Akron, Ohio.

NSC Rubber Section Meets

The Executive Committee of the Rubber Section, National Safety Council, met in St. Louis, Mo., on January 29th. Progress made by the Engineering, Research, Health, Membership, Rules and Regulations and Program Committees was discussed. A considerable amount of time was devoted to setting up a program for the Rubber Section for the 1953 National Safety Congress. R. M. Boyles (Midwest Rubber Reclaiming) is chairman of the Rubber Section for the 1953 season. R. W. Fickes (Goodyear) is vice-chairman in charge of programs, while F. W. Sands (U. S. Rubber) is secretary.

Edison's Rubber on Exhibit

Five pounds of goldenrod rubber made by Thomas Edison during his quest for a plentiful domestic rubber source was recently presented to the Ford Foundation by Robert H. Halgrim, curator of the Edison home and laboratory and a former associate of the inventor. The memento will become a part of the Foundation's traveling exhibition of objects from the Henry Ford Museum.

Data on India

India is currently producing about 1% of total world natural rubber, There are 170,000 acres under cultivation with an estimated capital investment of £1,270,000 (approximately $3,556,000). Annual production is running to about 16,000 tons. Of the total area under rubber, 82% is in Travancore and Cochin, 16% in Madras, and 2% in Coorg and Mysore. The plantations employ a labor force of some 48,000. Average yield per acre is still low, below 300 pounds.

Reconditioning Plastic Gloves

U. S. Industrial Glove Corp., Detroit, Mich., has announced a new service to industry, the reconditioning and reprocessing of worn or damaged, smooth and rough plastic dipped cotton gloves. The new service, designated as "Over-Kote," is available in practically all industrial areas through the firms Glovco National Service. The company states that investigation and tests have proven that up to 90% of previously discarded gloves can be reclaimed. The Glovco service includes cleaning, sterilizing, patching and repairing, re-shaping, re-coating, vulcanizing and pairing. Glovco National Service offers door-to-door pick up and delivery through 57 outlets in 20 states including some west of the Mississippi. The service cycle is about two weeks.

Dunlop Expanding Tonawanda Plant

Dunlop Tire & Rubber Corp. is reported to be spending $1,500,000 to nearly triple the output of foam rubber in its Tonawanda, N. Y., plant. New equipment being installed will raise the plant's foam output to 7,000,000 pounds a year from the 2,500,000 pounds at present. With its expanded output, Dunlop will be turning out 6 to 7% of the foam rubber produced in this country, company officials stated. Foam rubber made by the company is used principally in mattresses, cushions and head pillows. Company spokesmen have estimated that foam rubber accounts for about 5% of Dunlop's business. After the expansion, it will account for about 15%.

Texon Promotes W. N. Stickel

On February 1, 1953, Wesley N. Stickel, chief chemist of Texon, Inc., South Hadley Falls, Mass., assumed the position of director of research for the company. Mr. Stickel received his B.S. Degree at the New York State College of Forestry, Syracuse, New York, where he majored in pulp, paper and plastics. He is a member of TAPPI and the Division of Rubber Chemistry of the American Chemical Society. He is also a graduate of New York State Maritime Academy at Fort Schuyler, New York, serving with the U. S. Maritime Service during World War II, and as a Lieutenant in the U.S.N.R.

Iowa University Management Course

The College of Engineering, State University of Iowa, has announced that the fourteenth Summer Management Course will be held June 15 through June 27, 1953 in Iowa City. Since its inception, over 1000 representatives of American and foreign business, industrial, and governmental organizations have increased their understanding of the design and application of the major management techniques. It is an intensive course for factory managers, foremen, industrial engineers, methods and time-study analysts, cost accountants and office executives. The areas of production planning, job evaluation, motion and time study, wage incentives, plant layout, materials handling, quality control, supervisory training, labor relations and legislation, organization and policy, and public speaking are included. The regular State University of Iowa teaching staff will be augmented by outstanding men from a variety of industries and other educational institutions. Communications concerning the course should be sent to Wayne Deegan, 113 Engineering Building, State University of Iowa, Iowa City, Iowa.

Issues Highway Laws Study

The State of North Dakota has issued a comprehensive report of its highway laws. Entitled "Better Laws are Basic to Better Highways," the report draws attention to the serious inadequacy of our highway statutes and calls for the development of legislative guides as an aid to all states. Principal changes recommended include a declaration of legislative intent, classification of roads into state and county systems, development and use of construction standards for local roads, more effective cooperative relationships between and among the several jurisdictions responsible for road management, and a complete reorganization and simplification of the law into major functional categories. A series of bills based on the recommendations of the report are now before the North Dakota legislature. The study was made by the Automotive Safety Foundation, Washington, D. C., in cooperation with the North Dakota highway officials and specialists of the Federal Bureau of Public Roads.

"Royalastic" Vinyl Plastic Tape

A new vinyl plastic electrical tape has recently been added to the line of insulating tapes made by the U. S. Rubber Co. The tape is being marketed under the brand name of "Royalastic" and is a plastic film about 6 mils (0.006 inches) thick. One side has a pressure sensitive adhesive that makes the over-all thickness about 7 mils. The black tape has a tensile strength of 20 pounds per inch of width, excellent abrasion resistance, and good adhesion at low temperature. It has dielectric strength of approximately 10,000 volts. "Royalastic" tape is not affected by sunlight, and it has no corrosive effect on electrical conductors. It has excellent resistance to water, acids, alkalies, oils, and aging (room temperature). Currently, the tape is available in 66- or 30-foot rolls ¾ of an inch wide, and in 10-foot rolls ½-inch wide.

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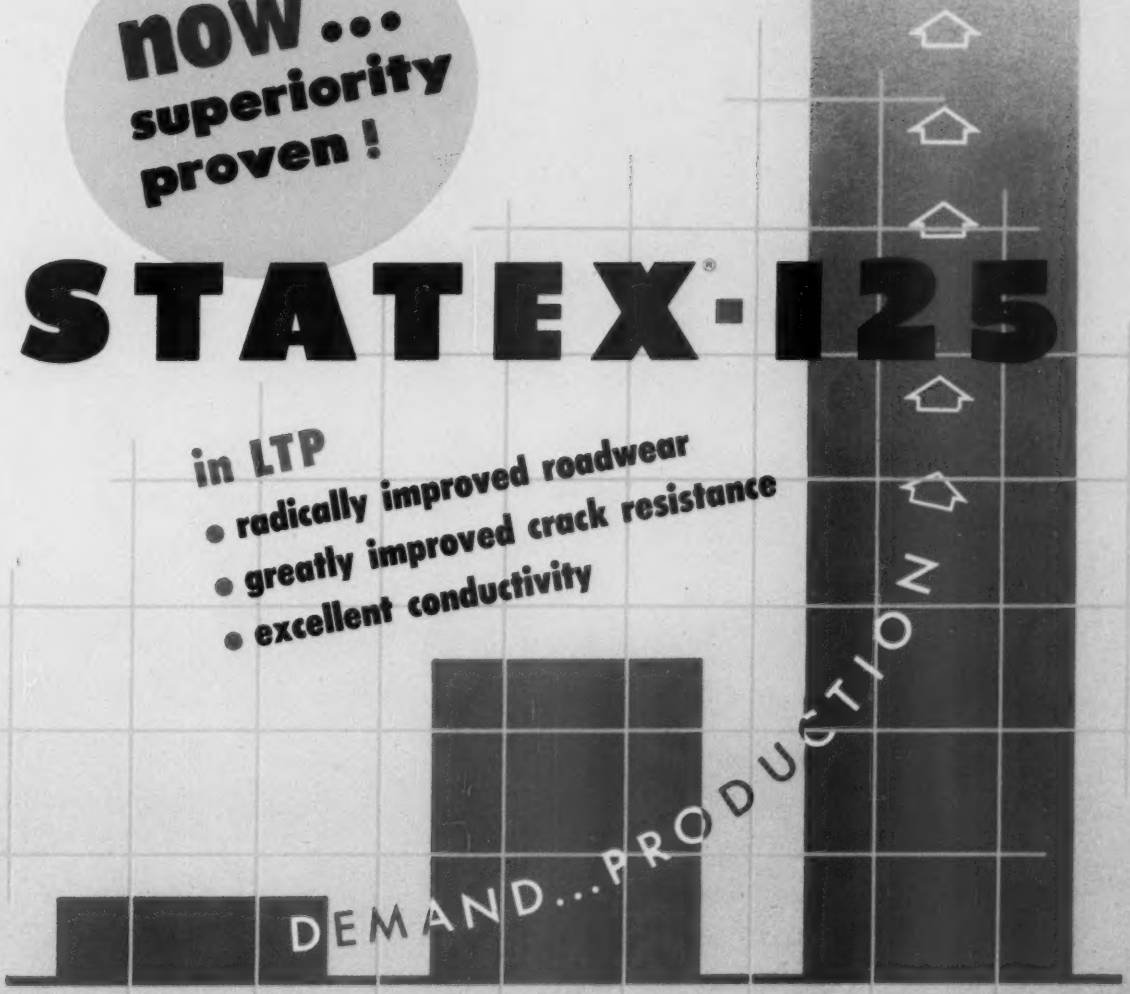

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MPC (Medium Processing Channel)

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New Hi-Miler Xtra Tred Tire

According to the Goodyear Tire & Rubber Co., more than half again as much mileage may be expected from a new truck tire made in both all-nylon and rayon cord and contructed of a tougher, more resilient rubber recently developed by the firm. Known as the "Hi-Miler Xtra Tred", the tire bears the same name as the company's present product but represents further improvements in materials and design. Outstanding feature of the new tire is its tread, which is wider, flatter and has as much as 50% more non-skid depth than standard tires, the company states. This new design places more rubber on the road and distributes wear more evenly. The longer-wearing tread rubber is the outgrowth of superior blending of carbon blacks used in the compounding process. Tread design of the tire, featured by five specially-grooved and notched ribs, has been further improved by approximately doubling the number of starting and stopping edges to give greater traction. Vents in the tire shoulders assure cooler running and protect the vital shoulder area. Shoulder ribs of the tire are narrower than the heavy center ribs, so that the heat hazard is lessened still further.

Celebrates 40th Anniversary

The Mechanical Goods Division of the Goodyear Tire & Rubber Co. marked its Fortieth Anniversary on February 1, 1953. Starting on February 1, 1913 with four products: balata belting, horseshoe pads, rubber tiling and soles and heels, this division of the company is now producing 20 major categories of products in the industrial rubber goods field with more than 20,000 different specifications for manufacture. Products of the division range from air seals for aircraft carburators with circumferances no larger than the head of a match to press pads weighing in excess of a ton. The greatest volume of production is in hose and belting. At present, the division is operating in the company's Plant 2 in Akron, complete plants at Lincoln, Nebr., and St. Marys, Ohio, and manufacturing divisions in the Los Angeles and New Bedford, Mass., plants.

Launches New Manual Series

Interscience Publishers, Inc., New York, N. Y., have embarked on the publication of a new series of manuals designed as reliable tools for laboratory procedures. The first manual in the series is "Statistical Methods for Chemical Experimentation," by W. L. Gore, and others are scheduled to be published at regular intervals. Emphasizing techniques rather than theory, these manuals will furnish in a small compass of about 200 pages a proper selection of classical and instrumental methods by following the critical recommendations of its carefully chosen authors. Particularly geared for beginners not conversant with the full scope of scientific development, they will provide sound, up-to-date guidance, the publishers state.

High Altitude Pressure Suit

B. F. Goodrich Co., Akron, Ohio, has developed and engineered a new high altiture pressure suit for the U. S. Navy. Garbed in the plexiglass-helmeted rubber suit, pilots may abandon jet or rocket aircraft in atmosphere bordering an outer space and live to tell the tale. The suit creates an artificial environment for the pilot similar to the atmosphere of the earth. The suit is designed to inflate automatically to survival pressures in case of failure of a plane's pressurization system. The suit carries its own supply of oxygen and air under pressure. This supply will sustain life as the pilot plummets through space on his way down to breathable atmosphere. The new suit is an outgrowth of nearly 20 years of development work by Goodrich engineers. The new suit is said to be the most flexible pressure suit ever made.

Columbia-Southern Fellowship

Columbia-Southern Chemical Corp., Pittsburgh, Penna., has announced a four-year science and engineering fellowship to be given to an outstanding high school senior at Barberton, Ohio, site of the firm's largest chemical producing plant. The scholarship is designed to encourage talented students with leadership characteristics to seek science and engineering courses. Although the $4,000 scholarship is currently limited to Barberton, similar scholarship programs may be extended in the future to other Columbia-Southern plant locations if it proves successful. Dr. Webster N. Jones, dean of the College of Engineering and Science at Carnegie Institute of Technology, has been named chairman of the Award Committee which will select the initial scholarship recipient this spring.

Changes in previously submitted questionnaires for the 1953-54 RUBBER RED BOOK will be accepted until May 1, 1953.

Fuel Oil Delivery Hose

A tough new hose for fuel oil delivery trucks has been developed by Hewitt-Robins Inc., it was announced recently. The hose has a new synthetic rubber cover made by a secret formula which provides 25 percent more resistance to wear and damage than any previous compound, the company states. Laboratory tests indicate it has remarkable ability to withstand abrasion when dragged over sharp curbing, rough pavements and knife-like gravel, as is frequently necessary in oil delivery service. The increased toughness is achieved without sacrificing the oil-resistance, flexibility and light weight required in fuel hose. Austin Goodyear, general manager of the Rubber Division of Hewitt-Robins, estimates that there are 8,000,000 feet of oil truck delivery hose in use in the United States. He said the footage has increased about 25 per cent in the last five years. The new hose will be made in three diameters—1 inch, 1¼ inch and 1½ inch. In addition to its use on fuel oil delivery trucks, the hose is recommended for launch loading service and airport refueling.

American Resinous Names Schibley

American Resinous Chemicals Corp. and American Polymer Corp. have announced the appointment of Schibley Solvents & Chemicals Co., 1940 East Sixth Street, Cleveland 14, Ohio, as sales agents in the state of Ohio. Loren Schibley, principal, is associated with Schibley & Ossmann, Inc., who have been agents for major chemical companies in the area for more than 25 years. Associated with Mr. Schibley is Orville Heinicke, a graduate chemist with extensive industrial sales experience in Ohio. This new appointment is another step in making available trained technical service to the customers of American Resinous and American Polymer Corporations.

"NCP 1909" Anti-Tack Solution

A new and thoroughly effective anti-tack solution has been developed and released for general distribution by the National Chemical and Plastics Co. of Baltimore, Md. The coating, which may be brushed or sprayed, is known commercially as "NCP 1909" and can be applied wherever starch or powder is used as an anti-tack agent. It can also be used as a finish coat, and can be applied before cure where a satin or starch finish is desired, the company states.

Goodrich Promotes Krupp

Carroll P. Krupp has been appointed manager of New Products Departments at B. F. Goodrich Co. He has been with the Company for 17 years and first joined the company's Machine and Process Development Department while studying engineering at the University of Akron. He later was a draftsman, then an experimental engineer. In 1951, he was named manager of pressure sealing development, a position he retained until his present assignment.

NEW POLYMERS AUTHORIZED BY OFFICE OF SYNTHETIC RUBBER, RECONSTRUCTION FINANCE CORPORATION

X No.	*Polymer Description*	*Polymer to be replaced effective Feb. 1, 1953*
X-718	37.5 parts Circosol 2XH + 100 parts base polymers — 23.5% bound styrene, peroxamine activated, fatty acid emulsified, carbamate shortstopped, 41° F reaction temperature, stabilizer Polygard or equivalent, Glue-acid coagulated — mean Mooney of masterbatch = 60 ML-4.	No Change
X-723	23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer, salt-acid coagulated. Mean raw Mooney 52 ML-4—Identical to GR-S-1500 except produced under carefully controlled conditions for use as the standard reference control bale.	New
X-724	37.5 parts Sundex 53 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch = 55 ML-4.	New
X-725	37.5 parts Shell SPX-97 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch = 55 ML-4.	New
X-726	37.5 parts Dutrex 20 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Money of Masterbatch = 55 ML-4.	New
X-727	37.5 parts Dutrex 20 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer, mean Mooney of masterbatch = 55 ML-4.	New
X-728	37.5 parts Califlux TT + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of Masterbatch = 55 ML-4.	New
X-729	37.5 parts Califlux TT + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of Masterbatch = 55 ML-4.	New
X-730	37.5 parts Philrich 5 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated 50/50 rosin/fatty acid emulsified, carbamate shortstopped 41° F reaction temperature, staining stabilizer — mean Mooney of Masterbatch = 55 ML-4.	New
X-731	37.5 parts Philrich 5 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer, mean Mooney of Masterbatch = 55 ML-4.	New
X-732	20 parts rosin (derived from sodium soap of a disproportionated rosin) + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — approximate mean Mooney of Masterbatch = 65 ML-4.	New
X-733	50 parts HAF black + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch (compounded) = 72.5 ML-4. Identical to GR-S-1601 but with Mooney of GR-S-1600, to replace GR-S-1601.	New
X-734	A low solids, low Mooney, cold latex — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, 41° F reaction temperature, 60% conversion, carbamate shortstopped — mean Mooney of contained polymer = 52 ML-4. Total solids approximately 20.0%.	New
X-735	37.5 parts of Circosol 2XH + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped 41° F reaction temperature. Polygard or equivalent stabilizer — mean Mooney of masterbatch = 55 ML-4.	X-722
X-736	37.5 parts Shell SPX 97 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch = 55 ML-4.	X-706
X-737	37.5 parts Sundex 53 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch = 55 ML-4.	X-716
X-738	25 parts Circosol 2XH + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped, 41° F, reaction temperature, staining stabilizer — mean Mooney of masterbatch = 60 ML-4.	X-628
X-739	25 parts Shell SPX 97 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch = 60 ML-4.	X-654

NEW POLYMERS AUTHORIZED BY OFFICE OF SYNTHETIC RUBBER (Cont'd.)

X No.	*Polymer Description*	*Polymer to be replaced effective Feb. 1, 1953*
X-740	25 parts Sundex 53 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch = 60 ML-4.	X-712
X-741	25 parts Dutrex 20 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate, shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch = 60 ML-4.	X-700
X-742	25 parts Califlux TT + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate, shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch = 60 ML-4.	X-715
X-743	25 parts Sundex 53 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin emulsified, carbamate shortstopped, 41° F reaction temperature, slightly staining stabilizer — mean Mooney of masterbatch = 60 ML-4.	X-713
X-744	25 parts Shell SPX 97 + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped, 41° F reaction temperature, slightly staining stabilizer — mean Mooney of masterbatch = 60 ML-4.	X-714
X-745	25 parts Circosol 2XH + 100 parts base polymer — 23.5% bound styrene, sugar free iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped, 41° F reaction temperature, stabilizer Wingstay S or equivalent — mean Mooney of masterbatch = 60 ML-4.	X-693
X-746	50 parts HAF black + 25 parts Circosol 2XH + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, 50/50 rosin/fatty acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer — mean Mooney of masterbatch (compounded) = 65 ML-4.	X-629
X-747	37.5 parts Circosol 2XH + 100 parts base polymer — 23.5% bound styrene, sugar free, iron activated, rosin acid emulsified, carbamate shortstopped, 41° F reaction temperature, staining stabilizer, mean Mooney of masterbatch = 55 ML-4.	X-717

NOTE: The above new polymers are experimental only and the Office of Synthetic Rubber, Reconstruction Finance Corporation, does not make any representation or warranties of any kind, express or implied, as to the specifications or properties of such experimental polymers, or the results to be obtained from their use.

Thai and U. S. Renew Pact

The Thai government recently decided to sign a new agreement with the United States government for the sale of 125,000 tons of rubber—virtually Thailand's entire production—during 1953. The terms will be similar to last year's agreement, with Thailand selling at prevailing world market prices. When some members of the Thai national assembly last year charged that the agreement was "persecuting" Thai economy, the United States offered to cancel it. But the Thai Government preferred to conclude the agreement. Thai officials said that with signs of a rubber surplus this year the government decided the wisest step was to assure sale by signing a new agreement.

Named Witco Sales Director

Max A. Minnig, vice-president and national sales manager of rubber chemicals for the Witco Chemical Co., has been made director of sales for the company. Mr. Minnig joined the company in 1946 in the Natural Gas Division, Carbon Black Operations. Appointed assistant to Mr. Minnig is William Wishnick who came to Witco in 1949 after graduating from the University of Texas. He began his career with Witco in the Chicago Asphalt Sales Division.

Currently Active Polymers

The Office of Synthetic Rubber, Reconstruction Finance Corporation, has issued a new list of currently active experimental polymers. Those experimental polymers not shown here have been discontinued or replaced by permanent numbered polymers. Active experimental polymers as of January 31, 1953, follow:

X-617	GR-S Latex		X-730	GR-S	
X-619	GR-S Latex		X-731	GR-S	
X-633	GR-S Latex		X-732	GR-S	
X-667	GR-S Latex		X-733	GR-S	
X-683	GR-S Latex		X-734	GR-S	Latex
X-684	GR-S Latex		X-735	GR-S	
X-695	GR-S Latex		X-736	GR-S	
X-708	GR-S		X-737	GR-S	
X-710	GR-S Latex		X-738	GR-S	
X-711	GR-S Latex		X-739	GR-S	
X-718	GR-S		X-740	GR-S	
X-724	GR-S		X-741	GR-S	
X-725	GR-S		X-742	GR-S	
X-726	GR-S		X-743	GR-S	
X-727	GR-S		X-744	GR-S	
X-728	GR-S		X-745	GR-S	
X-729	GR-S		X-746	GR-S	
		X-747	GR-S		

Thescoloid Equipment Auctioned

Pursuant to a court order, machinery and equipment of Thescoloid, Inc., were auctioned in a bankruptcy sale on February 10 at Woodbridge, N. J. Among the items offered were dipping machines, leach tanks, air tumblers, drying ovens, dip tanks, aluminum conveyors, about 46,000 aluminum balloon molds and a selection of office equipment. Also offered were quantities of rubber latex and other compounds.

Staflex MP Vinyl Plasticizer

Deecy Products Co., 120 Potter St., Cambridge, Mass., has introduced "Staflex MP," a new plasticizer for polyvinyl chloride. The product is a dialkyl phthalate that is designed as a complete replacement for 2-ethyl hexyl phthalate. Only primary alcohols are used in Staflex MP. It is recommended in all products where DOP is now being used. An odorless liquid, the material is designed to produce finished products of extremely low odor. It has a specific gravity at 25° C. of .97116 and at 30° C. of .96774. Its molecular weight is 425 and its saponification number is 264. Its freezing point is less than —56° C. Its refractive index, Na line, at 25°C. is 1.4839 and at 30° C. is 1.4820. Its color is 35 A.P.H.A. The solubility of Staflex MP in water is less than 0.2% and it contains 0.072% volatiles.

Martin Plans Plant Addition

Martin Rubber Co. has announced plans for the addition of two additional wings to its building at Long Branch, N. J. One wing will extend production space for the Finishing Department, while the other will be used for additional office space. It is expected that the first wing will be completed by early April, while the second wing will be finished in about three months.

NAMES IN THE NEWS

A. G. CAMERON, vice-president and general manager of Goodyear Foreign Operations, Inc., was recently presented with a long-term service pin by the parent company marking his completion of 40 years with the company.

EDWARD IZMIRIAN, formerly associated with the Acushnet Process Co. and H. Muehlstein & Co., has joined the Robinson Rubber Products Co., Minneapolis, Minn., as plant manager.

LAWRENCE P. APPLEY, president of the American Management Association, has been elected a director of the Dayton Rubber Co.

JAMES S. WALKER, associated with the Hooker Electrochemical Corp. since 1940, has been named manager of technical service for the firm.

S. S. GOODWIN, manager of mines for the New Jersey Zinc Co., has been elected a vice-president of the company with headquarters in New York City.

J. W. SHIRA, SR., president of the Oak Rubber Co., has been elected a director of the Toy Manufacturers of U. S. A., Inc.

C. H. HICKS, formerly associated with J. M. White, Inc., at Philadelphia, Penna., has joined the U. S. Wire & Cable Co., at Union, N. J.

DAVID E. STRAITON, associated with the B. F. Goodrich Co. since 1913, has been named manager of plant services for the company.

COLLIER W. BAIRD, JR., formerly assistant treasurer of the Baird Rubber & Trading Co., Inc., has been elected secretary of the firm.

JOHN F. ARTHUR, formerly district manager of the San Francisco branch for the U. S. Tire Division, U. S. Rubber Co., has been named manager of U. S. truck tire sales with headquarters in New York City.

GERALD E. TORGERSON, associated with A. Schrader's Son, Division of the Scoville Manufacturing Co. since 1949, has been appointed manager of aerosol valve sales.

LEONARD K. FIRESTONE, president of the Firestone Tire & Rubber Co. of California, has been named president of the Los Angeles Council of the Boy Scouts of America.

H. GORDON SMITH, executive vice-president of the U. S. Rubber Co., has accepted the chairmanship for solicitation of New York's rubber industry for the 1953 fund campaign of the New York Chapter, American Red Cross.

DICK KELLOGG, formerly engaged in a sales capacity for the Anaconda Wire & Cable Co., has been transferred to production and assigned to the Marion, Ind., plant.

EDWARD G. MACFADYEN, associated with the U. S. Rubber Co. since 1935, has been elected an assistant treasurer of the company succeeding WALTER C. REICH, who has retired after 49 years with the company.

JOHN STEARNS JOHNSON, assistant to the president of the U. S. Rubber Co., has been elected a member of the board of directors of the National Co., Malden, Mass.

HAROLD R. WILLIAMS, associated with the B. F. Goodrich Co. for the past 20 years, has been named Washington, D. C. district manager for the company's Automotive, Aviation and Government Division succeeding FRED T. MARSHALL, who was recently appointed director of federal government relations of the firm.

JOHN W. GOSSELIN, associated with the Phoenix Manufacturing Co., Joliet, Ill., since 1949, has been named assistant to the president of the company.

DR. WILLIAM F. TALBOT, in charge of the Plastics Products Division of the Rubberset Co., and director of research and development for the company, has been named a vice-president of the firm.

Sheffield Chemical Co. Formed

Sheffield Chemical Co. has been formed as a subsidiary of National Dairy Products Corp. This action formalizes into a separate corporation work carried on previously as the chemical division of Sheffield Farms, the Sealtest milk subsidiary which serves the metropolitan New York area. Officers of Sheffield Chemical Co. are J. G. Brereton, president and treasurer; J. R. Borst, vice-president, and F. A. Baldauski, technical director. James D. Sheridan is sales manager. The new company, with headquarters at Norwich, N. Y., will make products for use by chemical, pharmaceutical, food and other industries. The concern distributes edible milk proteins and special dietary supplements; lactic acid, lactates and other organic acids, milk sugar, amino acids; bacterial nutrients used in producing antibiotics; food flavoring agents; stabilizers for latex-based paints and protein derivatives used in making paper, rubber and adhesive products. Sheffield Chemical maintains its own technical staff and works closely with the research group of the parent concern. Further diversification of products in the chemical and pharmaceutical industries is planned.

Klipstein Named CCDA Medalist

Kenneth H. Klipstein

Kenneth H. Klipstein, assistant general manager and head of the Technical Department of the Calco Chemical Division of the American Cyanamid Co., Bound Brook, N. J. has been announced as the 1953 medalist for the annual award conferred by the Commercial Chemical Development Association for outstanding accomplishment in commercial chemical development. The award is to be made at a dinner honoring Mr. Klipstein following the annual open meeting of the Association on March 23 at the Statler Hotel in New York City. Mr. Klipstein's twenty-nine years in the chemical field embrace a broad experience touching on many important phases of development activity. It also is significant that this year's award winner bears the distinction of being one of the pioneers associated with the initial phase of organizing the group which is honoring him this year.

As a background for his career in development work at Calco, Mr. Klipstein spent seven years in research with E. C. Klipstein & Sons, Inc., joining them in 1924 with a Master's degree in chemistry received from Princeton that year and a Bachelor of Arts degree in economics conferred by the same school in 1921. His career with Calco began with the merger of E. C. Klipstein & Sons, Inc. with Calco Chemical Co., in 1933. His work on sales promotion at Calco was interrupted by the war, and from 1941 to 1945 he organized and managed the Priorities and Price Control Department of the American Cyanamid Co. His assignment on returning to Calco in 1945 was to take charge of the new products development program. A second interruption in Mr. Klipstein's career with Calco and again in the interest of the defense effort occurred in March, 1951, when he was appointed Deputy Director of the Chemical Division of the National Production Authority. Two months later he became Director, and on November 1, 1951, he advanced to the position of Assistant Administrator of the Chemical Rubber and Forest Products Bureau of the N. P. A. In 1952 he returned to Calco in his present capacity.

Glyco Products Co., Brooklyn, N. Y., manufacturer of edible and technical surface active agents, synthetic waxes and plasticizers, is now celebrating its 25th Anniversary.

ANTISUN is a blend of specially selected waxes compounded to yield excellent protection against sun-checking. The excellent performance properties of ANTISUN have been proven over many years of testing.

Recommended usage—2 to 4% of the weight of the rubber hydrocarbon, depending on the degree of protection desired.

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FINANCIAL NEWS

GOODYEAR REPORTS RECORD SALES OF $1,138,403,608 DURING 1952

Record sales of $1,138,403,608 and record net income of $39,009,866 were recently reported by the Goodyear Tire & Rubber Co. for the year 1952. It was the second year in succession that Goodyear sales exceeded the billion dollar mark. The 1951 total amounted to $1,101,141,392.

Last year's consolidated net income, which was the highest in the company's history, was equivalent to $8.30 a share on common stock now outstanding, including shares issued as a stock dividend during the year. This compares with $36,628,296, or $7.75 per share for the same number of shares in 1951.

In announcing the year's results, P. W. Litchfield, chairman of the board, reported that both unit and tonnage sales of Goodyear products were at an all-time high. While business outside the United States declined somewhat as the year progressed, this was offset by accelerated domestic business during the last quarter of the year.

"Goodyear plants are nearly all running at full production," Mr. Litchfield said. "Inventories of both raw materials and finished products are adequate. With the current increased production of new automobiles and the need for replacements of tires for the ever increasing number of vehicles on the road, capacity operations are anticipated during the coming months."

The capacity of Goodyear's domestic plants, both for tires and other rubber products, was increased during the year and still further capacity, which was delayed by the recent steel strike, will go into production in 1953. Capital expenditures last year amounted to $52,756,220 compared with $44,689,235 the year before.

Mr. Litchfield reported that a gradual but steady increase in filling government orders for military products took place during the year. New projects on guided missiles and other implements of defense were undertaken.

With the government strategic stockpile of natural rubber now practically complete and with synthetic rubber plants in full operation, supplies of new rubber seem adequate for the near future, with a more stabilized price structure, Mr. Litchfield said. "However, the forward forecasts indicate that the demand will increase faster than any preparations have yet been made to meet it. Because of the long time necessary to bring new plantings of natural rubber into bearing, and the unsettled political conditions in those parts of the world where it can be grown economically, it would seem that only a prompt start on a sizable increase in the productive capacity of synthetic rubber in this country will meet future needs of the industry on time."

Income of Goodyear's foreign subsidiaries last year amounted to $15,506,473. Dividends totaling $4,007,081 were received from these subsidiaries, the remaining earnings being invested in plants and equipment or added to their working capital. Of the total earnings, $5,017,000 was subject to various foreign government restrictions on the remittance of earnings and this amount has been charged to the year's operations and carried to the reserve for foreign investments.

Goodyear's working capital at the year-end amounted to $397,200,805, with cash in bank of $44,818,500. Current asset ratio increased to 5¾-to-1 compared with 4¾-to-1 a year ago.

United States and foreign income and excess profits taxes provided in 1952 totaled $69,096,511, equivalent to $15.86 per share of common stock outstanding, as compared with $74,911,921, or $17.19 per share in 1951. In addition, excise taxes on tires and tubes amounted to $62,203,010.

Seiberling Rubber Co.

For 1952: Net income of $948,915, which is equal to $2.43 a share, compared with $1,216,574, or $3.30 a share, in the prior year. Earnings per share were based on the 1952 issue of 301,010 shares which was increased to 376,010 shares by a new issue of 75,000 shares on December 19, 1952. On this basis, the 1952 earnings would be $1.94 per share. Net sales in 1952 were $41,646,702, against $43,681,425 in 1951. The balance sheet as of December 31, 1952, showed total current assets of $14,945,441 and total current liabilities of $4,902,482. At the end of 1951, total current assets were $15,283,882 while total current liabilities were $5,625,479. The report revealed the establishment of a British subsidiary, Seiberling Rubber Co. (Great Britain) Ltd., to sell in sterling bloc countries. This was done in cooperation with the Avon India Rubber Co., with which the company has a long-standing technical agreement.

Brown Rubber Co.

For 1952: Net income of $862,034, which is equal to $2.29 per share, compared with $959,415, or $2.55 a share, in 1951. Income from operations in 1952, before provision for depreciation, amounted to $1,882,406, against $2,219,367 in the previous year. As of December 31, 1952, total current assets were $2,687,408, while total current liabilities were $429,463. At the end of 1951, total current assets were $2,610,153, and total current liabilities were $804,479.

National Automotive Fibres, Inc.

For 1952: Net profit of $2,053,346, which is equal to $2.06 a share, compared with $3,200,220, or $3.21 a share, in the preceding year.

GENERAL TIRE 1952 SALES SET NEW RECORD AS EARNINGS DROP

General Tire & Rubber Co., Akron, Ohio, has reported that sales of the company in 1952 amounting to $185,914,247 established a new record. The figure was 8.9% above 1951 sales of $170,771,521. Net profit of the company in 1952 totaled $6,147,918, equal to $4.76 a common share, against $7,016,640, or $5.46 a share, in the preceding year. W. O'Neil, president of the company, stated that although 1952 profit was below that of 1951, the decline was slightly under 9% and this is more than made up by profits made and left in the foreign field. These profits were not included because the company felt it needed to retain them abroad as capital for expansion. The 1952 profit figure includes $929,342 as the company's net income from its television and radio holdings.

The company has reported that as of December 31, 1952, current assets were $76,997,835, while at the end of the preceding year, current assets were $65,922,045. Current liabilities as of December 31, 1952 were $38,807,977, while current liabilities as of December 31, 1951 stood at $31,884,545.

Mr. O'Neil opined that consumption of rubber in 1953 will be greater than in 1952. The industry will require 1,300,000 tons and the increase is mainly due to the greater demand for off-the-road and construction tires. This year, General Tire will complete a $1,000,000 expansion of its giant tire facilities to keep abreast of the trend in the rubber industry.

The optimistic outlook in both the truck and automobile industries, and the rising registration of vehicles plus increasing mileage on the highways indicates increasing demands for all rubber products, he said. All indications are that truck and trailer manufacturers won't be able to keep up with new vehicle demands, and the tire industry will be called on to produce in excess of 95,000,000 units to meet its 1953 tire requirements, Mr. O'Neil predicted.

The General Tire president reported successful operation of his company's Mechanical Goods Division, Plastic Division, Chemical Division, Athletic Ball Division, and also at its Aerojet Division in California. He also revealed that the company's present ownership in Crosley Motors, Inc., acquired during 1952 in a stock exchange with Powel Crosley, Jr., is approximately 72%.

Mr. O'Neil said that active consideration is being given by company directors to the possible merger of the Aerojet operation into the Crosley setup because of Aerojet's heavy requirements for metal fabrication.

Lee Rubber & Tire Corp.

Quarter Ended January 31: Net profit of $394,279, which is equal to $1.49 a capital share, compared with $530,300, or $2.09 a capital share, in the quarter ended on January 31, 1952. Net sales in the 1953 quarter were $10,337,242, against $11,216,316 in the comparable quarter of the preceding year.

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SALES OF $850,151,566 IN 1952 SET RECORD FOR U.S. RUBBER

U. S. Rubber Co. established a new sales record of $850,151,566 in 1952 and profit amounted to $28,169,955, the second highest in the company's history, according to the 61st annual report to stockholders recently released by H. E. Humphreys, chairman of the board. Net sales in 1952 were 1.5 per cent greater than in 1951 but profit fell short of the 1951 figure by 7 per cent. Profit was 3.3 per cent of sales and amounted to $4.33 a share of common stock compared with 3.6 per cent of sales and $4.76 a share of common stock for the previous year (after 3-for-1 stock split).

It was a year of continued high taxes, rising costs and stiffer competition and these factors accounted for the dip in profit despite the rise in sales, Mr. Humphreys reported. Federal and foreign income taxes and defense contract renegotiation totaled $60,384,335, equivalent to $11.39 a share of common stock and more than 5 times the dividends paid on the common stock during the year.

The company invested $26,000,000 in expansion and modernization programs during the year, $5,000,000 more than in 1951. It purchased a plastic film plant in Stoughton, Wis., added new equipment in all its tire plants to streamline tire production and started an expansion which will ultimately double the capacity of its Marvinol vinyl resin plant at Painesville, Ohio. It also expanded high-pressure hose manufacturing facilities at Passaic, N. J., and agricultural chemical production facilities at Naugatuck, Conn.

Net working capital at the year-end was $206,236,299, compared with $177,030,290 at the close of 1951. Mr. Humphreys said about 16 per cent of 1952 sales represented defense orders, compared with 13 per cent in 1951. The company started the year with a defense order backlog of $112,000,000, delivered $140,000,000 worth of defense products and ended the year with unfilled orders amounting to $96,000,000. Military tires, rubber-treaded tank tracks, aircraft fuel cells, aircraft hose and communication cables were the principal defense products.

The year saw the second highest foreign sales in the company's history despite difficult economic conditions. Foreign sales were hampered by an acute dollar shortage and a return to competition which had not been in evidence since the start of the Korean war. Sales of the company's Canadian subsidiary, Dominion Rubber Company, Ltd., continued at near record levels. Demand for Dominion tires exceeded production capacity and as a result an expansion of production facilities at Kitchener, Ont., is now under way.

"We foresee another good year for our company in 1953," Mr. Humphreys reported. "We expect sales to be somewhat higher than in 1952. Profit before taxes should continue good. Net income will be influenced to the degree that corporation tax rates may be changed.

"We plan to continue investing in modernization and plant expansion at about the same rate as in 1952. We are growing with the increase in population. More people mean more rubber-tired automobiles, more consumers of footwear, more industrial rubber goods. We are continuing to diversify. Chemistry is opening up new fields for us in synthetic rubber, plastics and other products."

Industry Revenue Increasing

Gross revenue of the rubber and tire manufacturing industry increased by 218.85% in the years from 1941 to 1951, according to a recent survey of corporate revenue and tax payments of 155 companies in 13 major industries. The tax picture was not quite as rosy, according to Fact Finders Associates, Inc., New York research firm which conducted the survey. In 1951, the rubber and tire manufacturers paid taxes equal to 14.59% of gross revenue, compared with the 11.6% average of all industries used in the report. The average gross revenue increase of the industries was 155%.

Parker Appliance Co.

Six Months Ended December 31, 1952: Net income of $498,932, which is equal to $1.54 a share, on sales of $11,040,530, compared with $297,049, or 92c a share, on sales of $10,529,047 in the corresponding six months of the previous year.

Dewey & Almy Chemical Co.

For 1952: Net profit, after a $329,000 tax refund, amounted to $657,369, which is equal to 72c a share, compared with $1,394,602, or $1.53 a share, in the preceding year. Sales in 1952 totaled $29,113,256 against $29,183,192 in 1951.

Flintkote Co.

For 1952: Net income of $4,896,373, which is equal to $3.61 a common share, compared with $5,516,371, or $4.11 a share, in 1951. Net sales in 1952 amounted to $84,039,381, against $84,265,587 in 1951.

Raybestos-Manhattan, Inc.

For 1952: Net profit of $3,175,611, which is equal to $5.05 a share, compared with $4,857,141, or $7.73 a share, in 1951. Taxes in 1952 declined to $5,180,000 from the $10,950,000 a year earlier.

United Carbon Co.

For 1952: Net income of $3,597,739, which is equal to $4.52 a share, compared with $3,645,560, or $4.58 a share, in the preceding year.

Plymouth Rubber Co.

Six Months to November 30: Net profit of $273,238, contrasted with a net loss of $21,416 in the corresponding period of the previous year.

GOODRICH 1952 SALES DECLINE WITH INCOME AT $32,364,008

In his statement to stockholders for the year 1952, John L. Collyer, president of the B. F. Goodrich Co., reported a decrease of 2.1% in company sales from 1951. Net sales in 1952 amounted to $624,102,207, compared with $637,722,241 in 1951.

After providing for all expenses, including taxes and depreciation, and after a reserve of $2,000,000 for increased replacement cost of facilities, net income amounted to $32,364,008, or $7.60 a share of common stock outstanding at year end after deducting dividends paid on the preferred shares. The corresponding net income for 1951, after a reserve of $4,000,000 for increased replacement cost of facilities, was $34,742,881, or $8.15 a share of common stock outstanding December 31, 1951, after deducting dividends on preferred stock, the report stated.

Provision for federal and foreign income and excess profits taxes and liability for renegotiation for the year 1952 was $57,083,000 as compared with $78,509,000 in 1951. Total taxes in 1952 amounted to approximately $91,416,000, equivalent to $21.95 a share of common stock, as compared with $109,600,000 in 1951.

Domestic inventories of crude and synthetic rubber and rubber-like materials have been valued on the Last-In, First-Out (LIFO) basis in both years. Provision for depreciation and leasehold improvements for tax purposes in 1952 was $11,265,549, as compared with a provision of $10,065,979 in 1951.

Dividends totaling $2.65 a share on common stock, including a special dividend of 50 cents, were paid in the year 1952, which compares with $2.50 a share paid in 1951. Outstanding preferred stock, all of which was redeemed on August 29, 1952, was paid dividends at the regular rate, totaling $3.33 a share, as compared with the regular dividend of $5.00 a share paid during all of 1951.

Current assets at year end were $308,799,659 and current liabilities were $111,683,193, a ratio of 2.8 to 1. Net working capital increased from $189,540,884 to $197,116,466 during the year. Capital expenditures during 1952 for expansion and betterment of manufacturing, distribution, and research facilities amounted to $21,915,000 and were financed from income retained in the business. Capital expenditures during 1951 were $19,051,000.

Outstanding preferred stock was all redeemed on August 29, 1952, at a cost of $21,203,100, and thereafter retired. This completed the preferred stock redemption program started in 1950, when $20,000,000 of previously outstanding shares were redeemed. The 3¼% promissory notes of the company, in the amount of $20,000,000 were issued on September 17, 1952, and mature on September 1, 1977, according to the report.

B. F. Goodrich also announced that the board of directors declared a dividend of 65 cents per share on the common stock, payable March 31, 1953, to stockholders of record at the close of business on March 12, 1953.

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Paraplex G-53 Vinyl Plasticizer

A new polymeric vinyl plasticizer, "Paraplex G-53," developed by the Rohm & Haas Co., Philadelphia, Penna., is said to have a range of properties that should interest formulators of vinyl products. It offers high resistance to extraction by such materials as oils, gasoline, hot soapy water, and detergents, has little tendency to migrate, and possesses good processing and milling qualities. On the basis of comparative tests with plasticized vinyl formulations, the manufacturer believes Paraplex G-53 to resist extraction by common oils, gasoline, hot soapy water, and detergents far more successfully than most vinyl plasticizers, except for Paraplex G-25, an exceptionally stable plasticizer in a higher price range. Good-to-excellent resistance is also shown to migration into rubbing varnish, automotive lacquer, furniture lacquer, Plexiglas, and polystyrene. Finally, laboratory comparisons of milling properties indicate that Paraplex G-53 possesses processing properties superior to most polymeric plasticizers. Paraplex G-53 is recommended for the following types of applications: vinyl refrigerator gaskets, tapes, high-temperature resistant insulations, baby wear, hospital sheeting, upholstery stocks, hose, and tubing. Its physical properties are given as: color (Gardner Varnish Scale), 8 maximum, acid number, 2.0 maximum; viscosity (Gardner-Holdt Scale, 25°C.), Z_4-Z_5; specific gravity (25°C.), 1.1015; and solidification temperature, approximately 10°C.

U. S. Rubber "Lifewall" Tubes

U. S. Rubber Co. has introduced a new safety feature in passenger car tires called "Lifewall" which, the company claims, offers motorists positive blowout prevention. Secret of blowout prevention is a double layer of nylon cord which is built into the inner air container. This serves as a shield, which absorbs road impact, and doubles the strength of the tire. To prove its toughness, the company recently put a U. S. Royal Master tire equipped with a Lifewall through its paces on the hard-packed sand beach at Daytona, Fla., riding it roughshod and at high speed over a five-inch steel spike and heavy concrete blocks. The car was even driven around without tires, mounted only on the inner nylon shield. Even though the steel rims were bent and twisted and other tire casings ruptured, the tire never had a blowout.

Standard Oil Chemists Honored

Three Standard Oil Development Co. research chemists were recently awarded gold watches by the company in recognition of the attainment of 100 United States patents by each. One of the research chemists so honored was Dr. William J. Sparks, director of the company's Chemical Division and co-inventor of Butyl rubber. Another was David W. Young, whose patents mainly cover antioxidants and new uses for polymers and resins. The third was Dr. Louis A. Mikeska, whose patents reflected his basic studies of lubricating oil additives.

"Moving Sidewalk" on Exhibit

What is said to be the world's first moving rubber sidewalk went into operation recently at the Chicago Museum of Science and Industry. John L. Collyer, president of the B. F. Goodrich Co., and Major Lenox R. Lohr, president of the museum, took the first ride on the new sidewalk, which is part of the company's extensive exhibit, the "Story of Rubber." The exhibit includes a 60 foot high guillotine in which visitors try to "execute" a puncture-sealing tubeless tire.

Another major exhibit trace the processing of synthetic rubber through the use of a scale model plant which actually shows the complete flow of materials. Other exhibits illustrate the collection of natural rubber on plantations, the preparation of ingredients in the making of synthetic rubber, the manufacture and braiding of hose, uses and application of Geon plastic, a working aircraft de-icer, operation of various belt systems, and the step-by-step manufacture of rubber footwear.

Parker Appliance Promotes Fort

Promotion of George A. Fort from manager of quality control to general manager of the Rubber Division of the Parker Appliance Co., Cleveland, Ohio was recently announced. Mr. Fort succeeds Edward W. Hollis whose appointment as district manager of a new industrial sales office being opened by the company in Cleveland was announced earlier. Succeeding Mr. Fort as manager of quality control is Anthony Fedewitz, formerly chief inspector. Mr. Fort is a graduate in mechanical engineering from the Case Institute of Technology. His connection with the company dates from 1940 when he became a draftsman in the company's Machine Design Section. Born in New York City, Mr. Fedewitz studied at Brooklyn Polytechnic Institute and at Columbia University where he obtained his degree in mechanical engineering in 1944. After the war, Mr. Fedewitz spent a year as a test engineer with the General Electric Co. and then attended the Harvard Business School for his master's degree in business administration. He returned to G-E and was quality coordinator at the company's Lockland, Ohio plant before he left to join Parker in 1951.

Goodyear Pliovic Resin G80V

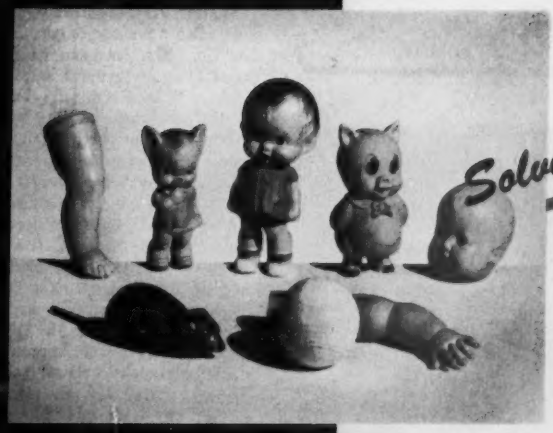
Introduction of the newest product in the series of Pliovic polyvinyl chloride resins was recently announced by the Chemical Division of the Goodyear Tire & Rubber Co. Designated "Pliovic G80V," the new resin is described as a general purpose, straight vinyl material having an approximate intrinsic viscosity of 0.80. It is designed to complement the use of the previously announced Pliovic G90V in calendering, coating and extruding operations. Because its intrinsic viscosity is lower than that of G90V, the new product's processing temperature requirements are 20 to 40 degrees (Fahrenheit) lower than those of G90V. Thermal stability of the new product is said to be comparable to G90V. This, combined with lower fusing temperatures, permits more rapid calendering and extrusion. Both clear and pigmented products are said to benefit from the resin's excellent light stability and good color. The nature of the resin recommends it for use in calendered fabric, film and sheeting, Goodyear states. Its unusual ability to run easily on three rolls of a standard calender has been demonstrated in production trials. Soft stocks are easily compounded for fabric coatings. Outstanding reception to colors, combined with the foregoing properties, recommends use of Pliovic G80V for rainwear, draperies, upholstery and shower curtains as well as for many industrial applications, according to the company.

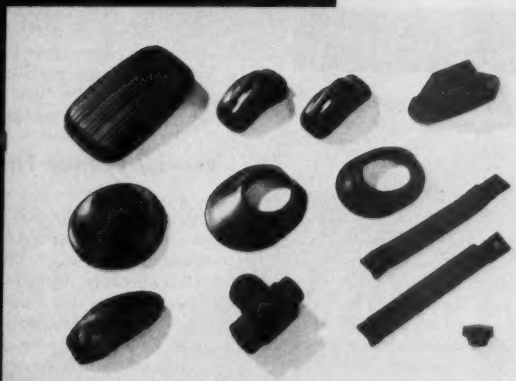
Motor Vehicle Grounding Strap

An unusual motor vehicle grounding strap that eliminates noise and dangers of sparking or losing pieces of metal which occur with ordinary drag chains is being produced by the Goodyear Tire & Rubber Co. Made of tough, abrasion-resistant synthetic rubber which has been specially compounded to conduct static electricity, the strap was designed primarily for use on gasoline and other fuel tank trucks as well as buses, taxicabs and private automobiles. Available in 20 inch and 28 inch lengths either one or two inches wide, the straps will fit any normal chassis. By extending a fastening chain or wire, the static conducting rubber strap may be used until it is almost completely worn away. Conductivity of the strap is said to be more than adequate for rapid dissipation of static charges built up on a vehicle chassis while it is in motion.

National Polychemicals Moves

National Polychemicals, Inc., recently organized New England chemical concern, has moved into its new offices and laboratory at the firm's new plant site on Eames Street, Wilmington, Mass., according to an announcement by Edward V. Osberg, general manager. Temporary offices and laboratory facilities in Boston are being discontinued. Construction of the first plant unit in Wilmington has been completed. This unit, designed to manufacture specialty organic chemicals, will begin operations in March. Planning for additional plant units to be built at the Wilmington site is now under way, according to Mr. Osberg.





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LOS ANGELES NEWS

Approximately 360 members and guests of the Los Angeles Rubber Group attended the February 3rd meeting held at the Hotel Statler in Los Angeles. The technical session of the meeting was addressed by Dr. Harry L. Fisher, director of the TLARGI Rubber Technology Foundation at the University of Southern California. Dr. Fisher spoke on the two new evening courses which are now being offered at the Foundation. One of these is for graduate students, while the other has been designed for students without degrees but with some practical experience. He also reviewed the general classification of polymers in use today.

The meeting was also addressed by Ralph De Palma, former racing driver, who recounted his experiences on the track. He also showed films of the 1952 Indianapolis Speedway races. Mr. DePalma said that auto racing makes a real contribution to automotive advances particularly in construction materials used and in tire design.

Another course, Rubber Technology II, has been announced by the TLARGI Rubber Technology Foundation. Joseph B. Larkin is the class director of the course which has been designed for administrative and supervisory personnel as well as those engaged in production, sales and technical work. Subjects to be discussed include natural and synthetic rubber, testing methods and procedures, compounding principles, processing, statistical quality control, heat transfer and vulcanization, mechanical and molded goods compounding, design and molds, and tire design and compounding.

The March 3rd meeting of the Los Angeles Rubber Group was to have been sponsored by the W. J. Voit Rubber Corp. The meeting was to have been addressed by Dr. Nelson E. Mathison, who was recently awarded the Helms Hall "Athlete of the Year" award as the nation's outstanding "skin diver" for 1952. He was to have presented a short talk on spearfishing and to show his own motion pictures on the sport in action. A question and answer period was to have concluded his portion of the program.

The technical session of the meeting was to have featured an address by Dr. R. A. Osten (DuPont) on "Utilizing the Properties of Hypalon." He was to have discussed the processing and the special properties of Hypalon. A full report on this meeting will appear in a future issue of RUBBER AGE.

Harry Trechter, formerly associated with the Gates Rubber Co., has joined the Harwick Standard Chemical Co.

Jack Weiner, previously associated with the W. J. Voit Rubber Corp., has joined the Union Rubber Co. at Oakland.

William J. Haney
Elected President of the Kirkhill Rubber Co.

As briefly reported in the last issue of RUBBER AGE, William J. Haney has been elected president of the Kirkhill Rubber Co., Brea, Calif., succeeding T. Kirk Hill, who has become chairman of the board. The new president has been with Kirkhill Rubber for 23 years and has held such positions as head foreman, plant superintendent and factory manager.

John Hoerger, formerly associated with A. Schrader's Son, Division of the Scovill Manufacturing Co., recently retired.

Larry Finley, formerly purchasing agent of the Tuscaloosa, Ala., plant of the B. F. Goodrich Co., has been named purchasing agent of the company's Los Angeles plant.

"Super All Traction" Truck Tire

A new truck tire, especially designed for use in areas where mud, snow or ice conditions are severe, has been announced by the Firestone Tire & Rubber Co. This new truck tire, the "Super All Traction", has a rugged, deep tread that bites into snow and mud and is said to give smooth, quiet, long-mileage performance in normal over-the-highway service. The tough body is constructed of super gum-dipped, tension-dried rayon cord. This gives the tire maximum strength and protects it from stretching, thereby assuring many thousands of extra miles of retread service, Firestone states. The Super All Traction tire has a wider, flatter tread and rugged traction design to provide positive gripping action for all types of service, both on and off the road. It is intended to supplement the Firestone "All Traction" truck tire for those operations where extra traction is desired for driving wheels. It is now in production in sizes up to and including 8.25 x 20.

Seiberling Rubber Appointments

Walter T. Johnson has been named general sales manager of the Seiberling Rubber Co. Mr. Johnson, who was promoted from assistant general sales manager, succeeds C. A. Reed who became assistant to the president. Douglas Mueller, assistant to the president and director of public relations, will continue in both posts but has been granted a leave of absence to attend the spring session of the Advanced Management Program at Harvard Business School, the company said. A 26-year employee of Seiberling Rubber, Mr. Johnson started as a salesman for the company in Arkansas. Later he was district sales manager in Buffalo, N. Y., Boston, Mass., and Atlanta, Ga. He was named assistant general sales manager in September, 1952. Mr. Reed who joined Seiberling Rubber on November 16, 1921, was one of the first employees hired by the company. He has headed various sales positions including service, government, manufacturers, mileage and truck tire sales. In 1945 he became assistant to the president, a position he held until he was named general sales manager in 1948.

Develops Emulsion-Type Adhesive

A heavy-bodied emulsion-type adhesive known as "Adhesive B55" has been developed by Federal Adhesives Corp., Brooklyn, New York. This product was designed specially by Federal's chemists for the adhesion of Pliofilm, the transparent rubber hydrochloride film manufactured by Goodyear to porous surfaces, such as kraft, glassine and other papers and boards. Laboratory tests by the manufacturer indicate that Adhesive B55 has excellent adhesive properties when used with any type of Pliofilm window bags and envelopes and in spot lamination of Pliofilm bags and winers into paper bags or cartons. It is also suitable for use as laminating agent between paper and Pliofilm. Excellent machining characteristics are reported for Adhesive B55. The fast initial tack is said to conform to normal machine speeds and timing for window bag and similar machines. Peel tests by Federal and Goodyear show that bonds between kraft paper and Pliofilm HP or P4, made with Adhesive B55, gave a fiber tearing bond with improved results.

Paracril Technical Bulletins

Several technical bulletins on the Paracril nitrile rubbers have been issued in recent months by the Naugatuck Chemical Division of the U. S. Rubber Co., Naugatuck, Conn. They include the following; Resistance to Solvents, Fuels, Oils and Chemicals (Bulletin No. 2); Specification Compounds and General Compounding Recommendations (Bulletin No. 3); Compounding and Processing Plasticizers (Bulletin No. 4); Specification Compounds for MIL-R3065 SB Series (Bulletin No. 5), and Curatives and Antioxidants in Paracril (Bulletin No. 6). Copies of any or all of these bulletins may be secured on request from the company. Copies of Bulletin No. 1, entitled "Standard Grades of Paracril — Characteristics and Compounding," are also available.

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CANADIAN NEWS

The 36th Annual Conference of the Chemical Institute of Canada will be held in Windsor, Ont. on June 4, 5 and 6. The 1,000 delegates expected to attend are assured of a varied program of technical sessions on industrial and research subjects, and speakers at the two luncheon meetings scheduled will be of international reputation. Plant visits for the delegates are also being arranged.

Conference headquarters will be in the Prince Edward Hotel, while all technical sessions will be in the modern Science Building on the campus of Assumption College. Special events scheduled for Thursday, June 4 include: the address of the C.I.C. Medalist, the Westman Memorial Lecture, the presentation of the Russell J. Eddy $1,000 Scholarship, and the annual business meeting at which the newly-elected President for 1953-54 will be introduced.

According to a recent announcement, a new plant extension by the Foxboro Co., Ltd. at Montreal has more than doubled its instrument manufacturing facilities in Canada. The recent expansion, second in the past five years, reflects the ever-growing demand for indicating, recording and controlling instruments by Canadian industry, the company stated.

Matching the original building in arrangement and appearance, the new section is of modern steel and brick construction, with spacious window area and sawtooth skylights. It adds 23,000 square feet of factory space for the production of instrument parts, assembly of instrument panels and cabinets, storage of materials, and for enlargement of the Plating, Finishing and Shipping Departments. An additional 5000 square feet on a lower level provides a new cafeteria for employees and training school facilities for customers' men, who are instructed in the proper use and maintenance of Foxboro instruments.

Barringham Rubber and Plastics, Ltd., Oakville, Ont., a subsidiary of Monsanto Canada, Ltd., have announced the sale of their tile manufacturing equipment to the Biltrite Tire Co., Ltd., Toronto, and the discontinuance of their Rubber Press Goods Division. In the future, Barringham will concentrate on the production of vinyl film sheeting and coated fabrics.

H. G. Taylor, president of the Precision Rubber Products Corp., Dayton, Ohio, has announced the establishment of a wholly-owned Canadian subsidiary, Precision Rubber Products (Canada) Ltd. The new company is located at Ste. Therese, de Blainville, Que., 18 miles from Montreal. Mr. Taylor said that the new subsidiary was established to bring to Canada a source for O-rings and "Dyna-Seal" packings. The new plant at Ste. Therese has 14,000 square feet of floor space and is scheduled to start production in April, 1953. It is expected that approximately 75 persons will be employed. Work is already in progress on the installation of machinery and equipment for the manufacture of O-rings and the Dyna-Seal packings. The company's general sales office for Canada is located at 10 McNab St., Bruce Bldg., Hamilton, Ont. Officers and executives of the new company are: *President*, H. G. Taylor; *Vice-Presidents*, R. E. Allen and W. A. Smith; *Secretary*, A. W. Meyering; *Treasurer*, Miss M. J. Brandenburg; *Plant Manager*, Charles M. Galliene; *Sales Manager*, Frank J. Brohman.

Vinylite Anatomical Models

Practically indestructible anatomical models with the texture of living tissues are being made of Vinylite resin-base plastisols by the Histoslide Co., Inc., Chicago, Ill. This durable, new anatomical sculpture is accurately modeled after authentic dissections and molded in three dimensions. Histoslide's anatomical models of the human figure are some of the largest ever molded of Vinylite resin-base plastisols. A muscle-man torso which has 26 removable organs and parts weighs about 35 pounds when completely as-

sembled. The torso alone with all 26 parts removed weighs about 25 pounds. This relatively large weight and the necessity of accurately reproducing minute detail created entirely new problems in plastisol molding. In cooperation with Watson-Standard Co., Pittsburgh, Penna. a special plastisol compound was developed that is fluid enough to fill out intricate details of the mold, flexible enough after curing to be easily removed from undercut mold sections and rigid enough to support the weight of the 25-pound torso without reinforcement. Lungs, stomach, brain and other organs are made to feel like real living tissue by the use of different plastisols based on Vinylite resins. Different degrees of hardness are even combined in a single part using the techniques developed by Histoslide. Economically produced at a price competitive with fragile plaster models, this new sculpture has basic colors pigmented in the plastisol and hand painted artwork applied by skilled artists. These paints, used to depict arteries, nerves and other anatomical systems, are also based on Vinylite resins to establish a permanent bond with the plastisol base. Repeated washing with strong soap solution will not fade or remove the paint and it resists chipping, scratching or tearing.

Mathe Chemical Co. Formed

Details on the formation of the Mathe Chemical Co., 169 Millbank Street, Lodi, N. J., have recently become available. The concern was formed in January, 1950 by Clarence E. Mathe, Jr., former plant manager for the Witco Chemical Co. The company is presently engaged in the manufacture of metallic stearates, fatty acid esters, vinyl resin emulsions and styrene resin emulsions. Ernest Segessemann, formerly vice-president of Fine Organics, Inc., joined Mathe Chemical in January of this year as technical director. The technical service manager is Wilbur A. Young, who joined the company in October, 1951. Mr. Young was formerly chief chemist for the Warwick Chemical Co. The company markets its products through agents, among these being Berlow & Schlosser Co., Adams-Henry Chemical Co., Millmaster Chemical Corp., Mueller Chemical Co., George A. Rowley & Co., and the Grasselli Division of E. I. du Pont de Nemours & Co., Inc.

Elected Hewitt-Robins Secretary

Herman A. Schaefer has been elected secretary of Hewitt-Robins Inc., succeeding George F. Goodyear, who retired last year when the company's executive offices were consolidated in Stamford, Conn. Mr. Schaefer has been serving as assistant secretary since May, 1952. He is also secretary of the Kentucky Synthetic Rubber Corp., an organization of 19 non-tire rubber companies, including Hewitt-Robins, which operates the government-owned synthetic rubber plant at Louisville, Ky. He is a native of Philadelphia and was graduated from the University of Pennsylvania, receiving a B.S. degree in economics from the University's Wharton School of Finance and Commerce in 1943 and his L.L.B. degree from the Law School in 1948. Before joining Hewitt-Robins early in 1952, he worked three years in the general practice of law in Philadelphia and one year as a tax attorney in New York City. He served in the United States Navy in World War II.

Names Three Vice-Presidents

Three executives of the Coated Products Division of the Interchemical Corp. have been appointed vice-presidents. They are: D. L. Douglas, sales manager of "Sanitas", Carl M. Parker, manager of the division's plant at Buchanan, N. Y., and Edgar S. Thompson, director of development.

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OBITUARIES

George E. Griffin

George E. Griffin, technical sales representative for the Harwick Standard Chemical Co., Akron, Ohio, since 1947, died in Fort Lauderdale, Fla., on February 6. Born on February 7, 1898, he

had gone to Florida to rest and recover from a heart condition. Mr. Griffin was graduated from Akron University with a degree in chemistry in 1921, and from the Cleveland Law School in 1932 with an LLB. He was admitted to the Ohio bar in 1932. Prior to his association with Harwick Standard, Mr. Griffin was with the B. F. Goodrich Co. which he joined in 1925. Here, he worked in the General Chemical Laboratory on control and analysis. Later, he was made technical group head in charge of molded goods. During World War II, he was a member of the consulting technical committee of the War Production Board on soles and heels. He also served as a member of the committee on molded rubber products and as an alternate member on the hard rubber committee. Mr. Griffin was a member of the American Chemical Society and the Akron, Buffalo and Detroit Rubber Groups. He was a member of the Masonic order and a Shriner. Funeral services were held on February 10 in Akron, with interment in Mount Peace Cemetery, Akron, Ohio.

Karl S. Chamberlain

Karl S. Chamberlain, formerly manager of the Australasian and Eastern Export Division of the Goodyear Tire & Rubber Export Co., died on February 24 in Pasadena, Calif. He was 73 years old. Born in Mt. Morris, N. Y., he attended the Rochester Business Institute before coming to Akron in 1927. Mr. Chamberlain had also been president of the Fisk Tire Export Co. during his career. He retired from active service with Goodyear in 1945.

William M. Jeffers

William M. Jeffers, former head of the Union Pacific Railroad and Rubber Administrator during World War II, died on March 6 at the Huntington Hotel in Pasadena, Calif. He was 77 years old. Mr. Jeffers was a man of decided opinions with a clear desire to make them known regardless of the consequences. "I would rather be president of Union Pacific," he once said, "than be President of the U. S."

He was appointed Rubber Director in September, 1942, charged by President Roosevelt with the task of creating a synthetic rubber industry. While Mr. Jeffers did not remain in office long enough to see the rubber produced, he did set the wheels turning. The plan he placed in operation had been worked out by Bernard M. Baruch's special committee and the verdict of Mr. Baruch on the job Mr. Jeffers did was "well done".

When Mr. Jeffers resigned he wrote to President Roosevelt that he felt the "big job of getting the synthetic plants into operation is over" and that he would "contribute more to the war effort by getting back to the railroad." The resignation was accepted by the President with a personal expression of gratitude.

He was born in North Platte, Neb., on January 2, 1876 and went to high school but left at 14 to supplement the family income. Thus began his career with the railroad. After an eventful career featured by rapid promotions, Mr. Jeffers was elected president of the company, a position in which he served from 1937 to 1946. In 1946, he was named vice-chairman of the company's board of directors.

During his lifetime, Mr. Jeffers often spoke of what he considered "straightline thinking" and expressed disapproval of a trend in which, he said, "Americans have become the victims of mass thinking; we have allowed ourselves to get too busy to think."

Charles C. Cadden

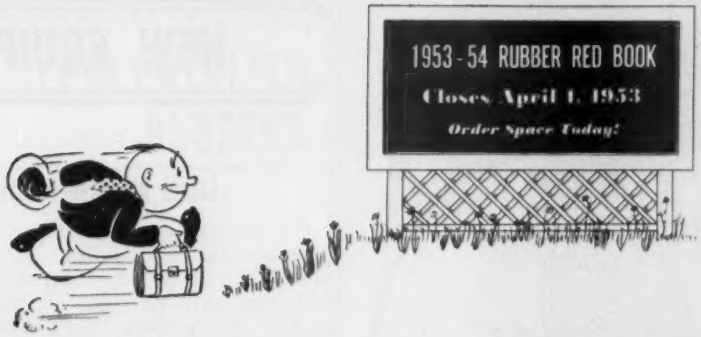
Charles C. Cadden, one of the rubber industry's best known inventors, died on February 23 at his home in Akron, Ohio. He was 73 years old. Born in Chicago, Ill., he came to Akron in 1910. Until he retired in 1943, Mr. Cadden had patented a steady flow of labor-saving devices for the B. F. Goodrich Co. At Goodrich he produced a new type of tire cord, special hose-making machines and many other pieces of rubber processing equipment. Prior to his work in Akron he invented a new type of telephone for a Chicago phone company and operated his own telephone company in Cadiz, Ohio. During World War I he patented the world's first automatic mail sorting machine. Funeral services were held on February 26 in Akron. He leaves his wife and daughter.

Named Norwalk Export Agents

Adam Johnstone, president of Drake America Corp., international trading company, has announced that his organization has been designated as exclusive overseas representatives for the complete "Norwalk" line of auto and truck-bus tires and tubes manufactured by Armstrong-Norwalk Rubber Corp., Norwalk, Conn. A special department has been set up within Drake's Export Division to handle the line, which is being returned to the world market for the first time since its withdrawal in 1950, when limited plant capacity and raw materials shortages made is impossible to properly service both domestic and overseas distributors. A major tire producer since 1911, Armstrong-Norwalk is a wholly-owned subsidiary of Armstrong Rubber Co., West Haven, Conn., whose tire and tube line Drake America has exclusively represented in foreign markets for almost a decade. The Norwalk line will be produced at the Armstrong-Norwalk plant in Norwalk, Conn., as well as at the parent company's three factories in Natchez, Miss., Des Moines, Iowa, and West Haven, Conn.

Goodrich Names Cox and Kimsey

Richard G. Cox and I. Newton Kimsey have been named in organizational changes announced by the Industrial and General Products Division of the B. F. Goodrich Co. Mr. Cox has become eastern division manager with responsibility for all activities in the Boston, New York, Philadelphia, Akron, Detroit and Chicago Districts. Mr. Kimsey was appointed western division manager with responsibility for Los Angeles, San Francisco, Seattle, Denver, Kansas City, Dallas and Atlanta. Mr. Cox, formerly manager of original equipment sales, has been with the company more than 27 years. An engineering graduate of the University of Akron he served at one time as manager of lathe cut, molded, extruded and sponge sales. Mr. Kimsey, formerly field sales manager for the industrial products department, has been with the company since 1922. He became manager of the Akron sales district in 1939 and in 1949 became field sales manager.



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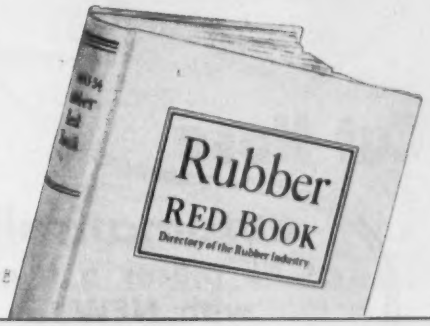

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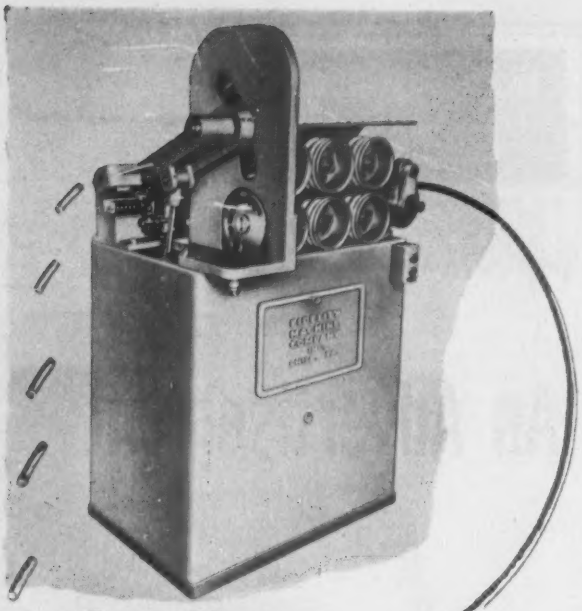

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NEW EQUIPMENT

Liquid Abrasive Blasting Machine

The availability of a newly-redesigned Jet Blast Liquid Abrasive Blasting Machine designed to clean, finish, burr, blend or etch a wide variety of dies, molds, tools and other parts has been announced by R. W. Renton & Co., 755 Addison Road, Cleveland 3, Ohio. Engineered for around-the-clock use, the liquid slurry is drawn up by siphon injection and propelled from the blasting nozzle by means of a high velocity air stream. The only moving part within the cabinet is the blower which is used to ventilate the cabinet. Consequently, there are no critical wear points which might necessitate frequent servicing.

The new Jet Blast machine features maximum versatility. It is designed to handle abrasives ranging from 60 to 5000 standard screen size, and new design permits fast changeover of abrasive slurry. A reversible pump located beneath the cabinet effects complete change in less than 5 minutes. A special method of maintaining the slurry in suspension permits higher concentration of abrasive at the point of work and thereby increases speed of operation.

Size of abrasive particles, concentration of abrasives in solution, the distance between nozzle and work, and the supply air pressure can be varied to produce the results desired. The machine handles the most delicate cleaning problems without surface damage or dimensional alterations. It is particularly effective in removing rust, scale and other deposits, and the clean matte surface which it produces increases adherence of paint, porcelain, rubber or electroplated metals. It can effect any desired finish on any flat or irregular surface.

Because the Jet Blast machine is engineered for maximum simplicity, operators require little training. Work is inserted through an access door on the side of the water-tight cabinet, and the operator reaches in through gauntlet-protected armholes. Work is held in one hand or placed on a work table, while abrasive stream is di-

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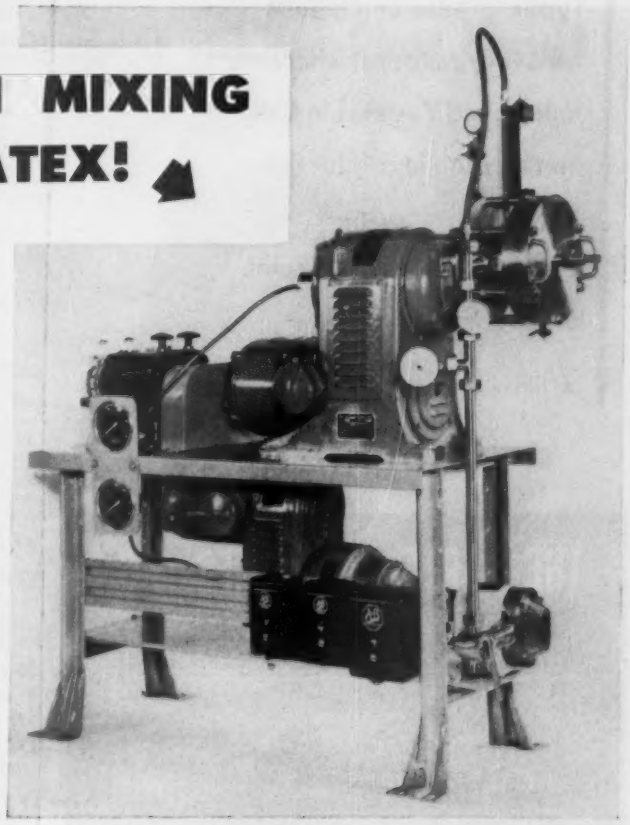

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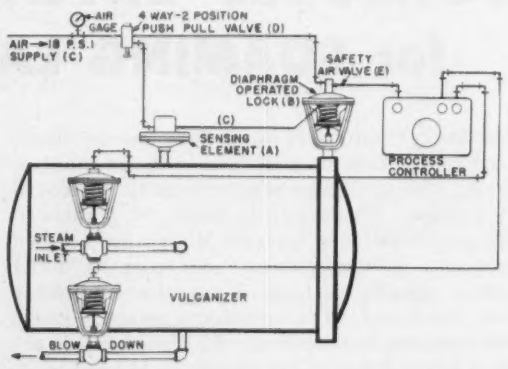
rected by the other hand. Full control is exercised over operation by means of conveniently located padded knee pedals. One governs the flow of abrasive slurry from the nozzle, and the other regulates cleaning of the light and observation port.

The machine is available from stock in three standard models and can be furnished in almost any size required. It can be equipped with a turntable to speed handling of pieces and can be furnished with up to eight fixed spray guns. In the larger models, the jets can be arranged to produce automatic or semi-automatic operation. Because the Jet Blast is compactly built, it is especially adapted to dual machine set-up for production line operation. This permits the successive use of two sizes of abrasives, one for rough cleaning and the other for fine finishing.

Safety Door Lock for Vulcanizers

A new door lock for vulcanizers, which it is claimed makes impossible careless opening and closing of vulcanizer doors, has been introduced by the Weston Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark, N. J. Completely automatic in operation this new safety door lock prevents admission of steam until the door of the vessel has been completely closed and automatically locked, and prevents the door from being opened until pressure in the vessel has been reduced to 10 inches of water or less.

As shown in the accompanying diagram, the sensing element is mounted on the shell of the vulcanizer and receives the full pressure in the vessel. This exclusive element operates dependably at extremely low levels of



10 inches of water or less and yet withstands pressure up to 150 psi. It controls the operation of the diaphragm-operated lock which is mounted on the door ring and locks the door by means of a stop bolt. The position of this stop bolt controls the operation of the safety air valve mounted on top of the diaphragm-operated lock, and either permits or prevents passage of air to the control instrument. On hand-controlled vessels, the air line from the safety air valve is connected directly to diaphragm valves on the steam inlet and blow-down lines. Eighteen pounds of compressed air are required for operation.

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"Stanley Rubber Cutters have given us greater speed and convenience in cutting out special foam latex shapes for upholstery. On slab and mattress stock, this tool cuts smoothly, cleanly. It's fast, even on intricate shapes. And, it's light (4 lbs.) . . . can be used easily by girls and carried from one location to another."

That is the experience at the Fall River (Mass.) plant of the Firestone Tire and Rubber Co. where fifteen Stanley Rubber Cutters are at work. You can save time and material with this handy tool in cutting sponge or foam rubber up to 6" in thickness. It follows any line or templet with hairline precision at speeds up to 30 ft. per minute.

Ask your tool supplier about Stanley Rubber Cutters or write for detailed literature to: Stanley Electric Tools, 426 Myrtle Street, New Britain, Connecticut.

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Resorcinol-formaldehyde resin is superior to other adhesives in bonding synthetic reinforcing fibers to rubber, synthetic and natural. Industrial belting, hose and tires are among the many rubber products made stronger, more permanent by Resorcinol-based resins.

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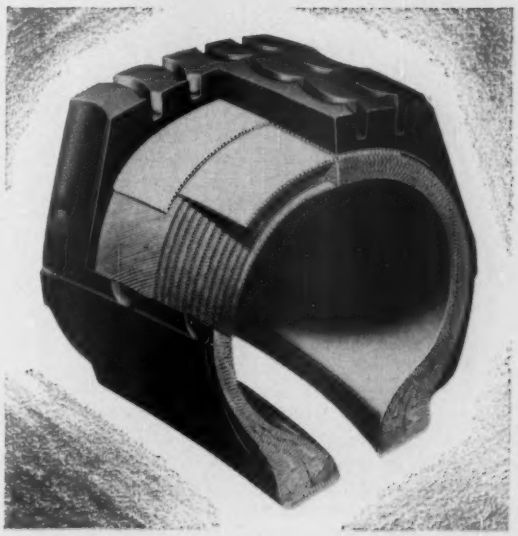
Rugged tires, such as those for trucks, airplanes, farm and earthmoving equipment, generally require nylon and rayon cord for their construction. Other available adhesives do not form satisfactory bonds between these smooth synthetic fiber filaments and the rubber.

Resorcinol-formaldehyde resin, however, creates a bond between synthetic cords and rubber that will withstand prolonged flexure in service without separating.

For further information about the interesting reactions, properties and other uses of Resorcinol, write to:



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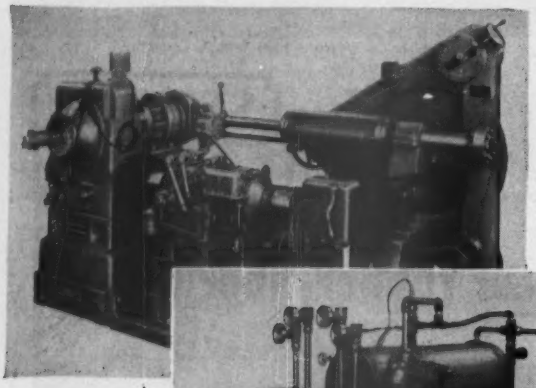
Chemical Division, Dept RA-33, Koppers Building, Pittsburgh 19, Pa.

Of Particular Importance

To the Wire Insulating Industry

The room temperature compound process and associated equipment recently developed by the Western Electric Company, Incorporated, offer nine important advantages. These advantages begin with the storage of completely mixed, ready-to-extrude, rubber, GR-S, or Neoprene compounds and extend to a smoother and improved appearance for the finished product.

The complete extruder vulcanizing portion of the room temperature compound process is available to insulated wire producers* from John Royle and Sons who, for seventy-two years, have been building extruding machines to meet the most exacting process requirements.



↑ Royle #2 (3¼") Continuous Vulcanizing Extruder for room temperature compound process.

→ Royle extruder temperature control unit utilizing steam and hot water.

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- Reduction in electrical faults
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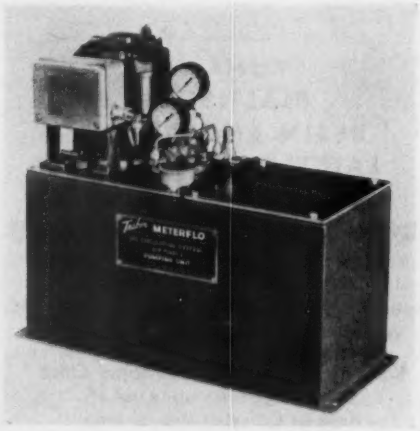
Meterflo Oil Circulating System

A new oil circulating system of interest to rubber and plastics manufacturers has been developed by the Trabon Engineering Corp., 1814 East 40th St., Cleveland, Ohio. Known as "Meterflo," it utilizes the company's positive piston displacement principle and is said to be a sure method of controlling the flow of oil to every bearing under pressure. Features of the system include the following: Flow rates up to 80 cubic inches per minute; RTP-



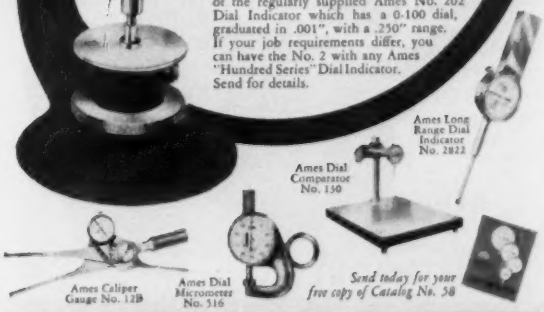
2000 series Rotary Type Pump units available in complete range of discharge capacities; pump units with or without sumps include motor, pump, hi-lo dual acting pressure switch, cartridge type filter, pressure gauges, oil level gauge, and fill screen; sturdy sump units include removable baffles for easy cleaning of tank; type MXO and MO metering valves accurately control flow of oil to each bearing in the system; pair of constantly blinking lights, actuated by flow of oil, available as optional signal equipment. The hi-lo pressure switch, connected to the warning lights, permits ready identification of too-high or too-low pressure, blocked line, low oil supply, or will shut down the machine being lubricated.

Toughness
SEE PAGE 710

AMES

No. 2 Dial Comparator

This is smallest in the Ames' line of high quality dial comparators. It is ideal for desk or bench use in the fine inspection of small precision parts. Light in weight, its broad base makes it very stable. The capacity approximates that of the regularly supplied Ames No. 202 Dial Indicator which has a 0-100 dial, graduated in .001", with a .250" range. If your job requirements differ, you can have the No. 2 with any Ames "Hundred Series" Dial Indicator. Send for details.



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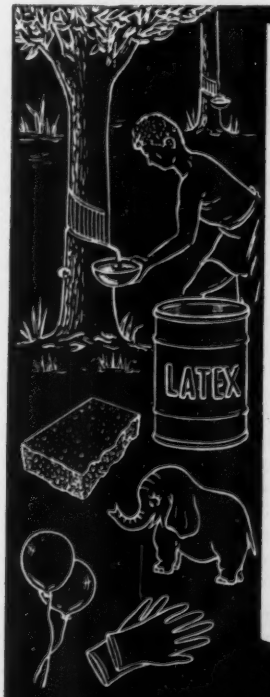

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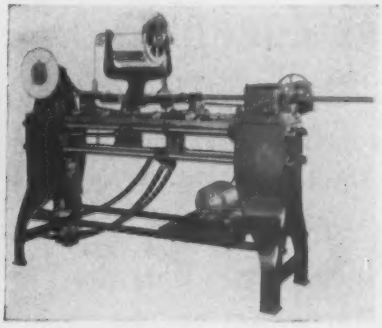

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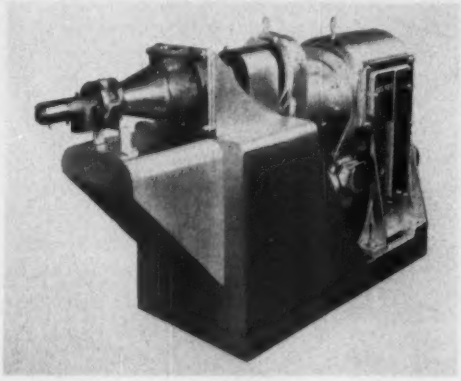
Standard of the World

Flow-Master Semi-Works Continuous Mixer

A new model Flow-Master Mixer for semi-works and laboratory use has been added to the line of continuous mixers featured by the Marco Co., Inc., Third and Church Streets, Wilmington, Delaware. Called Model RF 7.5, results achieved are said to match those of the



large commercial size Flow-Master continuous mixers. According to the company, continuous mixing and/or blending is a phase that should be of interest to every processor who has need to put together two or more substances, either fluid or dry. The new semi-works unit was developed because of the many requests from the processing industries for a unit of this size. The Flow-Master mixers are widely used in the production of latex foam sponge rubber.

New Anco Check Valve

Instead of depending on the conventional "O" ring for its seal, the new Anco Check Valve has a valve seat formed of two hardened steel pieces which are designed, ground and lapped for long life. Another advantage cited by the makers, Anco, Inc., of Providence, R. I., is that the device, which consists of seven parts in all, has only one moving part. Termed ideal for use with accumulators, the Anco Check Valve prevents reversal of flow of air, oil, water or chemicals, providing control lines with a minimum of pressure drop and positive sealing against return flow. No pressure is lost through the valve, it is reported. Cracking pressure is five pounds or below at all pressures. The valve is produced regularly in aircraft and standard pipe sizes, and can be made to withstand chemical reaction of the materials being handled. These valves are produced in forged aluminum for aircraft and in steel for commercial application. In all sizes, internal passage areas through the Anco valve are in excess of the pipe size being used.

Development of a new **gang-operated disconnect method** for de-energizing the fuses on high voltage motor control and for making them safe and convenient for handling has been announced by the Electric Machinery Manufacturing Co., Minneapolis, Minn. Called the SA-Fuse System, it utilizes a movable panel on which current-limiting fuses are gang-mounted.

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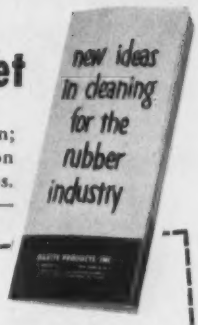

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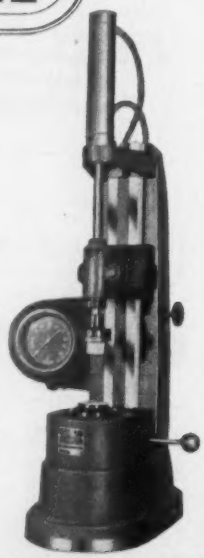

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REVIEWS

BOOKS

Rubber Trade Directory of Great Britain: 1952-53. Published by Maclaren & Son, Ltd., Stafford House, Norfolk St., London W.C. 2, England. 6½ x 9¼ in. 856 pp. £3.3.0 ($9.00 in the United States and Canada).

(Copies available from RUBBER AGE)

Larger by 104 pages than the previous edition, which was the first to be issued, this latest edition of "The Blue Book of the British Rubber Industry" has been completely revised and some additional information has been added. Alphabetically arranged throughout, it provides ready answers to practically all everyday queries about every section and every aspect of the British rubber manufacturing industry. There are 16 separate sections in which are listed rubber manufacturers and their products, suppliers of rubber machinery and equipment, suppliers of chemicals and compounding ingredients, dealers in raw and scrap rubber, trade and research organizations, trade marks and brand names, rubber technology schools and courses, technical consultants, etc. There is also a Who's Who Section covering personnel in the British rubber industry which runs to 108 pages. A list of overseas agents and offices is supplied in an appendix. For the convenience of the user, both the contents and the index are published in English, French, German and Spanish.

•

Standards on Rubber Products (with Related Information). Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penna. 6 x 9 in. 680 pp. $5.00.

Prepared by ASTM Committee D-11 on Rubber and Rubber-like Materials, the newest edition of this compilation includes in their latest form 104 widely used ASTM standards, including 67 test methods; 30 specifications; 4 lists of definitions relating to methods of testing, specific gravity, rheological properties of matter, and procedures relating to conditioning and weathering; 2 tentative recommended practices—one for low-temperature tests of rubber, the other for automotive and aeronautical rubber; and 1 recommended practice to be used for designating significant places in specified limiting values. The following list of materials and subjects covered by standard tests and specifications will give some idea of the contents: Processibility tests; chemical tests of vulcanized rubber; physical tests of vulcanized rubber; aging and weathering tests of rubber; low-temperature tests of rubber; automotive and aeronautical rubber; gasket materials; hose and belting; tape; electrical protective equipment; rubber-coated fabrics; insulated wire and cable; hard rubber; latex foam, sponge and expanded cellular rubber; rubber adhesives; rubber latex; packing materials; etc.

•

Handbook of Chemistry. (8th Edition). Compiled and edited by N. A. Lange. Published by Handbook Publishers, Inc., Sandusky, Ohio. 5⅜ x 7¾ in. 2014 pp. $7.00.

The latest edition of this valuable handbook continues to uphold the publisher's claim that it is "a reference volume for all requiring ready access to chemical and physical data used in laboratory work and manufacturing." A thorough revision has been made of practically all material standing from the preceding seventh edition, including hundreds of changes of numerical values scattered throughout the work, as well as the extension and rewriting of some 26 tables. As usual, the handbook is divided into three major sections, as follows: (1) Life and Fire Hazards; (2) Chemical and Physical Properties of Classified Substances; (3) Miscellaneous Tables of Specific Properties. New tables in the current edition include ionization potentials of the elements, classification of clay minerals, glossary of inorganic chemical nomenclature, titrimetric indicators, and density of moist air.

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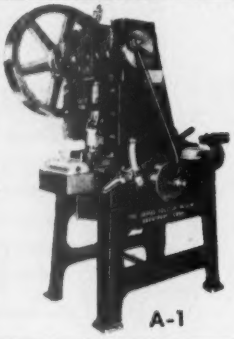
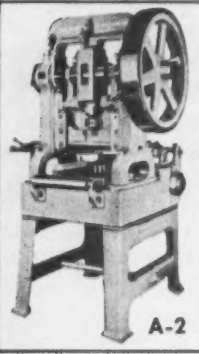


A-1



A-2

MODEL A-1

Cutting Heels at high speed production or short runs.

MODEL A-2

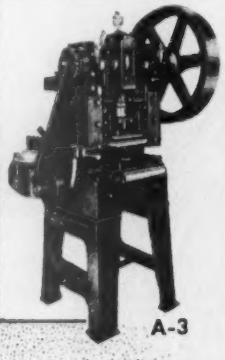
Cutting Multiple Heels, Half and Full Soles with stock grain.

MODEL A-2s

(Not illustrated)
Cutting across grain of stock.

MODEL A-3

Cutting Multiple Heels and Taps with or across stock grain.



A-3

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BOOKLETS, CATALOGS, etc.

Hycar Softener Study. B. F. Goodrich Chemical Co., Rose Building, Cleveland 15, Ohio. 8½ x 11 in. 72 pp.

Much of the more useful information which has been obtained from a continuing study to determine the effects of plasticizers or softeners on typical formulations of Hycar rubbers is contained in this technical report. The data presented may be used by the rubber compounder to determine the plasticizers to select for his specific formulation. Many of the tables in the report are reprinted from earlier publications, such as the Hycar Blue Book and Softener Study 2A, but most of these have been supplemented by more recent data obtained on formulations containing newer Hycar polymers and plasticizers which have been more recently introduced. An alphabetical list of the plasticizers and softeners covered is furnished together with the names of the suppliers.

•

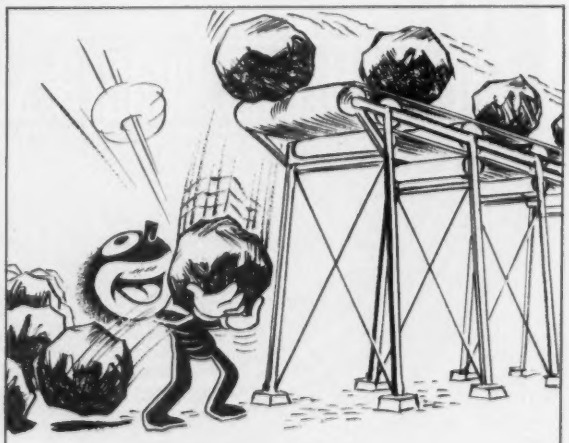
Aliphatic Nitrogen Compounds. Carbide and Carbon Chemicals Co., 30 East 42nd St., New York 17, N. Y. 8½ x 11 in. 48 pp.

The thirty-five aliphatic nitrogen compounds sold in commercial quantities by the company are outlined in this booklet, with data given on their uses in many industries, physical properties, specifications, shipment, and constant boiling mixtures. A bibliography is included that gives the important references in chemical literature to these amines and nitriles. Also listed are 18 amines that are available in research quantities, together with suggested applications. An entire section of the booklet is devoted to the specification test methods used by Carbide & Carbon for its aliphatic nitrogen compounds.

•

Patterson-Kelley Equipment. (Catalog No. 12). Patterson-Kelley Co., Inc., East Stroudsburg, Penna. 8¼ x 10¾ in. 12 pp.

The dry blending, process and heat exchange equipment made by the company is described and illustrated in this catalog. Special emphasis is placed on the twin-shell dry blender which is said to have caused many processing firms to revamp their blending methods for such products as blending powders, grains, pellets and flakes. In addition, data is given on double-cone and ribbon blenders, kettles, evaporators, agitators, autoclaves, pilot-plant units, etc.



Toughness

SEE PAGE 710

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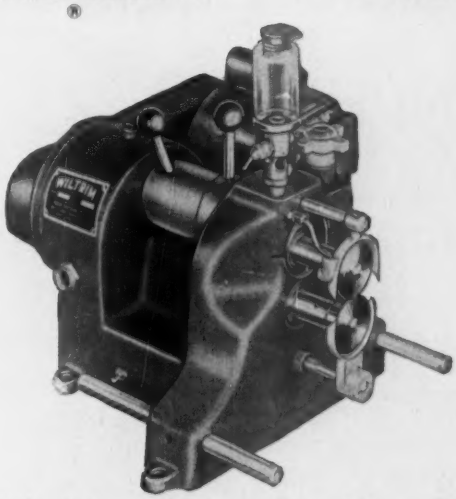

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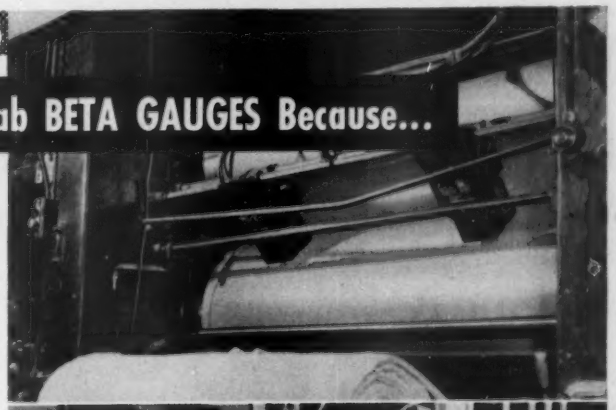

. . . if they hadn't, they wouldn't have purchased a total of five gauges over the past several years. The upper picture shows one of their newest installations. Two Tracerlab Backscatter units are controlling the thickness of rubber as it comes through the calender prior to being applied to the fabric backing. The number of off-weight rolls has decreased by 75% since their gauges were installed, Hood reports. Since off-weight rolls averaged about 70% heavy and 30% light, there has been appreciable material saving and improved quality.

By having a gauge near each end of the calender, non-uniform material produced by "cocked" rolls has been eliminated. The lower picture shows the circular recorders mounted above the Tracerlab gauge consoles. Located 50' from the gauge heads they are adjacent to the operators. Product changes can be noted instantly and the necessary calender adjustments made.

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REVIEWS (CONT'D)

Goodrich Reclaimed Rubber. Industrial Products Division, B. F. Goodrich Co., 500 South Main St., Akron 18, Ohio. 8½ x 11 in. 30 pp.

The numerous reclaim compounds offered by the company, including tire, peel, carcass and mechanical blends, are outlined in this bulletin, with chemical and physical properties, characteristics, and recommended uses indicated for each specific grade. In addition, some general data is furnished, including the history of reclaimed rubber, types of reclaims, selection of proper reclaim, and reclaim compounding principles. The main reasons for considering the use of reclaimed rubber are also detailed.

•

Barrett Standard Industrial Chemicals. Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N.Y. 8½ x 11 in. 16 pp.

This catalog contains concise descriptions and uses of the vast array of industrial chemicals offered by the company, most of which are of coal tar origin. Set up in tabular form, data is presented on 17 different groups of chemicals including tar acids, tar acid oils, phthalic anhydride, plasticizers, phenolic resins, Cumar resin, Resin S, rubber compounding materials, naphthalene, coal tar bases, niacin, isonicotinic acid, aromatic industrial solvents, flotation agents, pickling inhibitors, tar distillates, and miscellaneous chemicals.

•

The Union Bay State Story. Union Bay State Chemical Co., Inc., 491 Main St., Cambridge 42, Mass. 8½ x 11 in. 24 pp.

Issued in commemoration of the company's fiftieth anniversary, this booklet gives a pictorial outline of the company's major productive activities. Equipment used in the production of numerous types of cements is shown, with brief descriptions given of each unit. Apparatus used in the manufacture of special polymers is also shown, such as steam-jacketed emulsifiers and reactors. A portion of the booklet is devoted to the company's extensive laboratories. The history of the company is traced chronologically.

•

Commercial Neoprene Weatherproof Wire. Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Delaware. 8½ x 11 in. 14 pp.

This is a progress report on the aging of commercial neoprene-covered weatherproof wire. A report on the condition of samples of several types of wires after both natural and simulated aging tests is given, while some data on tests designed to predict resistance to cutting at the insulators, outages and corona cutting is included. Photographs of the specific testing equipment utilized are reproduced in the report.

•

Barrett Elevators and Cranes. (Bulletin No. 5211). Barrett-Cravens Co., 4609 So. Western Blvd., Chicago 9, Ill. 8½ x 11 in. 36 pp.

The complete line of industrial elevators and portable cranes featured by the company is described and illustrated in this bulletin. The portable elevators shown include hand and electrically-operated types, and with single, hinged and telescopic uprights, featuring load capacities from 500 to 5000 pounds, any platform dimensions required, and with lifting heights up to more than 30 feet. Operating views add to the value of the bulletin.

•

Sheet and Plate Fabrication. Kirk and Blum Manufacturing Co., 3171 Forrer St., Cincinnati 9, Ohio. 8½ x 11 in. 36 pp.

Containing over 40 pages of illustrations of the company's fabricating plant and manufacturing facilities, this booklet also gives a comprehensive view of many of the typical parts and products which are regularly manufactured. Among the latter are breechings and casings, general factory equipment, machine bases and guards, tanks, plating equipment, appliance parts and electrical enclosures. The company utilizes metals of practically all kinds in its fabrication work.

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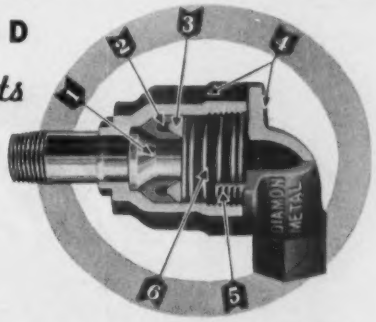

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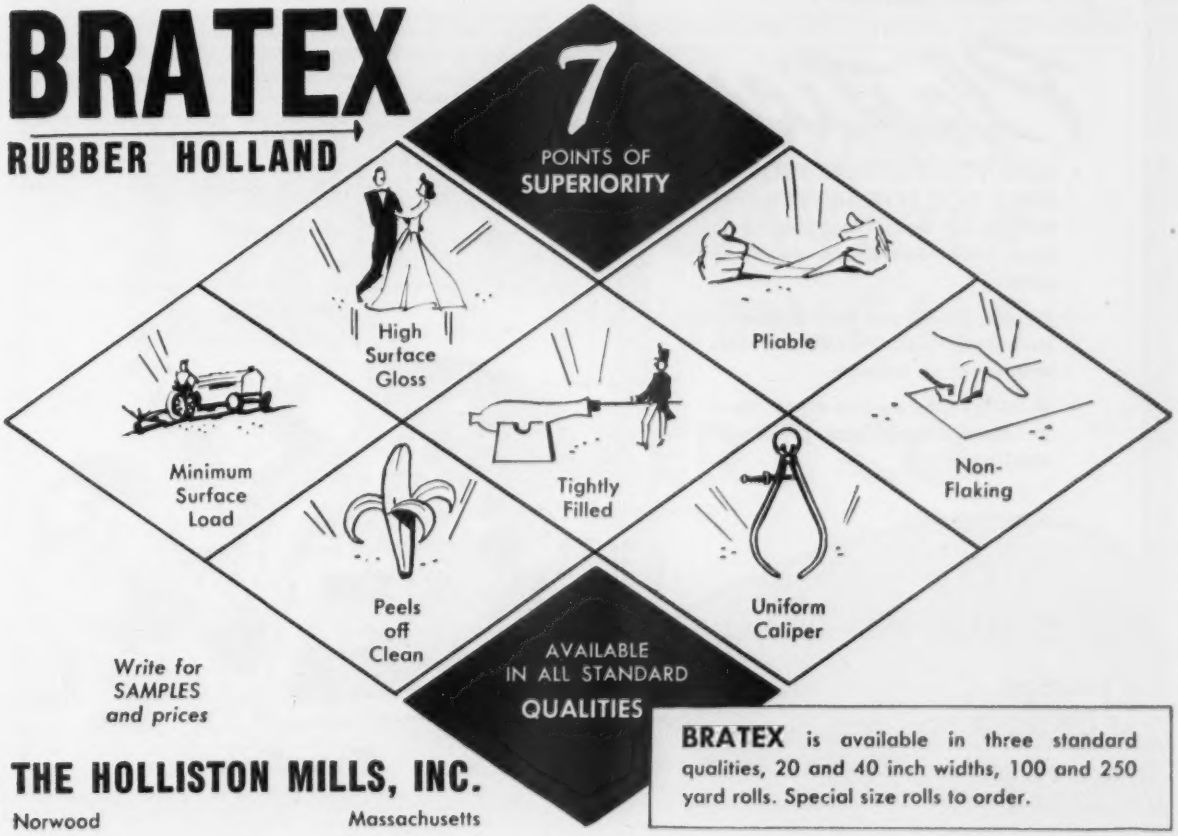

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REVIEWS (CONT'D)

Compressed Air Power in Industrial Production. Compressed Air and Gas Institute, 1410 Terminal Tower, Cleveland 13, Ohio. 8½ x 11 in. 36 pp.

This pamphlet, which contains 63 illustrations including photographs and line drawings, is the third in a series of engineering studies in the educational program of the Compressed Air and Gas Institute. Directed to designers, engineers and production men in industrial plants, it discusses pneumatic tools and aids to production, and presents concisely, but comprehensively, the many uses of compressed air in industrial production. Among applications covered are actuation by air cylinders, agitation of liquids, blast cleaning, clamping, drilling, grinding, molding and die casting, riveting, and spraying.

•

Cleveland Tramrail Engineering and Application Data. (Booklet No. 2008-H). Cleveland Tramrail Division, Cleveland Crane & Engineering Co., Wickliffe, Ohio. 8½ x 11 in. 12 pp.

This booklet is designed to give anyone a good conception of what tramrail overhead materials handling equipment consists of and how it can be applied to bring about one or more of 15 definite advantages, including the lowering of manufacturing costs. All of the more important features of overhead tramrail equipment are described, including the flexible method of track support, carrier designs, track switches, cranes, automatic interlocks, and types of electrification. Many photographs and sketches are used throughout the booklet, and a number of varied applications are illustrated.

•

Harshaw Vinyl Stabilizers. Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio. 9 x 11½ in.

This folder includes data sheets on the company's relatively new line of vinyl stabilizers, with physical properties and stabilizing systems indicated for each material. The data sheets cover barium, cadmium, barium-cadmium, calcium and zinc type stabilizers, as well as organic assistants. These stabilizers are used in calendered films, sheets, non-rigid extrusions, organosols, plastisols, coatings, solutions, rigid extrusions, etc. The company's vinyl stabilizing systems generally comprise small amounts of two or more stabilizers, selected to give the required control against vinyl degradation.

Toughness
SEE PAGE 710

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MARKETS

NEWS-PRICES

NEW YORK, MAR. 5, 1953

Raw Rubber

Natural: Since our last report (February 2), the price of spot rubber on the New York Commodity Exchange has moved in a range of 1c. High for the period was 28.12c reached on February 3 and again on March 4, and low was 27.12c reached on February 10 and again on February 17. The average price of spot rubber for the month of February was 27.58c based on 18 trading days. This compares with an average of 29.40c in the previous month.

Trade opinion seems to hold that the market for natural rubber may stabilize for some time, although many express the opinion that there is too much natural rubber available. According to some observers, manufacturers are in a rather comfortable position as far as rubber supplies are concerned. World production is said to be exceeding the world off-take from month-to-month. Unless some unforeseen political disturbances develop, the market for natural rubber may continue to drift downward until U. S. consumers manifest more eagerness to utilize natural rubber in place of synthetic.

Reports from abroad state that Indonesia is considering the re-evaluation of the Rupiah. This may encourage increased offerings of natural rubber to the United States.

Exports of all grades of rubber from Malaya during February were estimated at 66,749 long tons by the registrar of Malayan statistics. This compares with 70,721 tons exported in January, 1953, and 80,384 tons in February of the previous year.

Synthetic: New records for synthetic rubber production in 1953 are predicted by Reconstruction Finance Corporation officials. RFC predicts that synthetic production in 1953 will hit 750,000 tons, topping the previous high of 717,693 in 1945. According to preliminary estimates by the U. S. Department of Commerce, 1952 production amounted to 636,969 long tons.

The department has also estimated that 806,500 long tons of synthetic rubber were consumed in the United States in 1952. This compares with the 758,897 long tons used in the previous year. Stocks of GR-S continued to drop under heavy consumer pressure, ending the year at 84,462 tons, down 21,000 tons from 1951.

The RFC recommendations on the disposal of the synthetic rubber plants (reported in full elsewhere in this issue) has attracted widespread attention. No little confusion has been engendered by some of the recommendations, particularly one suggesting that the government maintain unsold plants in stand-by condition. RFC officials, at a recent press conference, "guessed" the price of both synthetic and natural rubber might be increased somewhat after the plants were turned over to private firms, but added that prices might go down as new plants went into production and manufacturing techniques improved.

A complete listing of rubber prices appears elsewhere on this page.

Price Data

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM FEBRUARY 3 TO MARCH 5

Feb.	Spot	Mar.	May	July	Sept.	Sales
3	28.12	27.65	27.10	26.70	26.30	38
4	27.75	27.50	26.96	26.60	26.30	42
5	27.62	27.60	27.00	26.60	26.20	32
6	27.75	27.62	26.95	26.55	26.20	3
7	——	——	——	——	——	——
8	——	——	——	——	——	——
9	27.25	27.11	26.55	26.15	25.75	57
10	27.12	27.10	26.35	26.00	25.75	43
11	27.38	27.20	26.55	26.25	26.00	60
12	——	——	——	——	——	——
13	27.25	27.25	26.65	26.25	26.00	24
14	——	——	——	——	——	——
15	——	——	——	——	——	——
16	27.25	27.25	26.65	26.30	26.10	3
17	27.12	27.11	26.50	26.10	25.90	24
18	27.38	27.30	26.65	26.20	26.00	12
19	27.62	27.75	27.10	26.60	26.35	30
20	27.62	27.50	26.95	26.55	26.25	56
21	——	——	——	——	——	——
22	——	——	——	——	——	——
23	——	——	——	——	——	——
24	27.38	27.40	26.80	26.40	26.10	61
25	27.88	28.00	27.20	27.00	26.80	61
26	28.00	28.50	27.50	27.10	26.80	42
27	27.75	28.00	26.90	26.50	26.25	55
28	——	——	——	——	——	——
Mar. 1	——	——	——	——	——	——
2	27.62	28.00	26.91	26.50	26.10	41
3	27.88	28.10	27.25	26.70	26.25	71
4	28.12	28.25	27.50	26.75	26.25	127
5	27.62	27.50	26.90	26.25	25.75	60

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.27⅝
March	.27½
April	.27¼
Thin Latex Crepe:	
Spot	.31½
Thin Brown Crepe, No. 2	.24⅞
Smoked Blankets	.24¼
Flat Bark Crepe	.21¾

London Market

(Standard Smoked Sheets)

April-June	26.25 - 26.54
July-Sept.	26.10 - 26.40

Singapore Market

(Standard Smoked Sheets)

April	25.52 - 25.59

Synthetic Rubber

(Dry Types—Per Pound)

Butaprene NF	.490 - .530	
Butaprene NL	.500 - .510	
Butaprene NAA	.540 - .550	
Butaprene NXM	.580 - .590	
Chemigum 30N4NS	.500 - .510	
Chemigum 50N4NS	.500 - .510	
Chemigum N3	.580 - .590	
G-E Silicone Rubber (compounded)	3.15	-4.00
G-S Silicone Gum (not compounded)	——	-4.48
GR-I	——	- .2075
GR-S	——	- .230
Hycar OR-15	.580 - .590	
Hycar OR-25	.500 - .510	
Hycar OS-10	.550 - .560	
Neoprene Types CG and AC	——	- .500
Neoprene Type E	——	- .650
Neoprene Types FR and KNR	——	- .800
Neoprene Type GN	——	- .380
Neoprene Type GN-A	——	- .380
Neoprene Type RT	——	- .400
Neoprene Type S	——	- .380
Neoprene Type W	——	- .400
Paracril B	.500 - .510	
Paracril BJ	.500 - .510	
Paracril C	.580 - .590	
Silastic (compounded)	2.35	-4.40
Thiokol Type A	——	- .470
Thiokol Type FA	——	- .640
Thiokol PR-1	——	- .950
Thiokol Type ST	——	-1.000

Middling Upland Quotations

	Feb. 2	March 5		
	Close	High	Low	Close
Mar.	33.26	33.50	33.34	33.42
May	33.51	33.60	33.48	33.57
July	33.76	33.79	33.66	33.77

Liquid Latex

Natural: No significant change has taken place in the natural latex situation during the past few weeks. The tight nearby supply situation continues. Prices for "spot" and "nearby" centrifuged latex continues steady at 39 to 40c levels even though prices for No. 1 Ribbed Smoked Sheet have declined somewhat. Buying pressure on forward contract differentials has caused prices to advance to levels which may encourage greater production.

Preliminary estimates by the Department of Commerce indicate that 53,639 long tons (dry weight) of natural rubber latex were consumed in the United States in 1952. In the previous year, 46,750 long tons were consumed. Stocks on hand at the end of 1952 amounted to 5,977 long tons.

Synthetic: Prices of GR-S latices range from 21½ to 26c per pound solids, in tank cars f.o.b. works. A uniform freight rate of 1c per pound wet weight charged by the Reconstruction Finance Corporation pays freight to the buyer's destination within the United States.

The trade estimates that neoprene latices are now being consumed in the United States at a rate of 600 tons a month, with production slightly larger than demand. Stocks appear to be in excess of 45 days supply.

Acrylonitrile latices are being consumed in this country at a rate of about 250 tons per month, with production in excess of this figure. Stocks are estimated sufficient for 60 to 90 days. Total synthetic latex production in the United States in the first eleven months of 1952 is estimated at 35,218 long tons.

Cotton

The price of middling uplands on the New York Cotton Exchange has moved in a range of .65c since our last report (February 2), high for the period being 34.20c reached on March 4, and low being 33.55c reached on February 13 and again on February 16. The average price of middling uplands for the month of February was 33.76c based on 18 trading days. This compares with an average of 33.24c in January.

Authorizations for cotton this year may result in exports of 1,000,000 bales from the 1952-53 crop with Mutual Security Agency Funds. Last year MSA authorizations amounted to $156,000,000, or enough to result in exports of about 700,000 bales of cotton. Authorizations to date already amount to $185,000,000.

Because cotton this season is substantially lower in price than it was last year, a government source stated, the same amount of money will buy about one-seventh more cotton. As further authorizations are expected for cotton from this year's crop, it is estimated that total MSA authorizations may permit the export of 300,000 more bales than last year.

Cotton acreage allotments and marketing quotas may have to be imposed for two seasons, for the 1955-56 season as well as the 1954-55 season, several trade and government experts have said. From present indications, they stated, it is quite possible that the carryover at the end of the 1953-54 season may be about 7,000,000 bales. Marketing quotas may not be able to lower this figure enough in the 1954-55 marketing year to forestall quotas in the following season.

Quotations for middling uplands appear elsewhere on this page.

MARKETS

NEWS-PRICES

NEW YORK, MAR. 5, 1953

Reclaimed Rubber

The trade reports that although February was a short month, a slight increase in usage of reclaim was noted toward the end of the month. It has also been reported that automotive usage is starting to pick up a little. The reclaiming industry is still running at about 70% of capacity according to trade estimates.

Preliminary estimates by the Department of Commerce indicate that 279,727 long tons of reclaimed rubber were consumed in 1952. This compares with the 346,121 long tons consumed in the previous year. In 1952, the department stated, 273,343 long tons of reclaim were produced, contrasted with 365,933 in 1951. There were 1,855 long tons of reclaim imported in 1952, against the 767 long tons imported in the preceding year. Exports of reclaim in 1952 amounted to 11,096 long tons. In 1951, 14,722 long tons were exported. Stocks at the end of 1952 stood at 30,063 long tons. As of December 31, 1951, stocks on hand amounted to 45,082 long tons.

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.10½
First Line Whole Tire	.10
Second Line Whole Tire	.09½
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.08¾
Black Carcass	.14¼
No. 1 Light Colored Carcass	.20¾
No. 1 Select Peel	.11¾
No. 1 Peel	.10½
Butyl Tube Reclaim	.12½
S.P. Natural Rubber Black Tube	.16
Natural Rubber Black Tube	.15
Natural Rubber Red Tube	.22
Natural Rubber Gray Tube	.24¼

Industrial Fabrics

According to the Textile Economics Bureau, Inc., shipments of rayon for tires and related uses reached new highs in 1952. From the 1950 quarterly average of 75,300,000 pounds, shipments jumped to 81,100,000 pounds in 1951 and for the first three quarters of 1952 were at a quarterly average rate of 100,100,000 pounds. During 1951, the tires and related uses trade displaced the broad weavers as the number one customer of the industry.

Recent surveys have indicated that an increasingly greater interest is being expressed in passenger car tires with nylon cord. Nylon yarn, however, is more expensive than rayon, and it costs more to produce nylon tires. People in the trade express the opinion that this cost will drop as engineers develop means of using nylon more economically. As this progress takes place and as more nylon becomes available, its use in tires will expand. Current prices follow:

(Prices f.o.b. Shipping Point)

Rayon Tire Cord

1100	lb.	.76½
1650	lb.	.73½
2200	lb.	.73

Nylon Tire Cord

210	lb.	2.00
840	lb.	1.98

Rayon Graded Fabric

1100	lb.	.72
1650	lb.	.69½
2200	lb.	.68½

Cotton Chafers

14.4 oz. (per square yard)	lb.	.74
9.25 oz. (per square yard)	lb.	.69½
11.65 oz. (per square yard)	lb.	.66
8.9 oz. (per square yard)	lb.	.71

Scrap Rubber

Business in the scrap rubber market during the past period has been limited. Dealers in the New York area are reported to be complaining that at currently quoted prices in New York (normally about $5.00 below the Akron price) it is hardly profitable for them to handle mixed auto tire shipments. Exporters also point out that lack of dollar exchange has greatly curtailed foreign buying.

Dealers point out that the freight by truck from New York to even nearby reclaiming centers runs about $6.00 a ton. In addition, there is another $1.00 or so for loading, plus the original cost to the dealer of the casing, plus handling and storage costs. Current prices follow:

(Prices Delivered Akron)

Mixed tires	ton	16.00
Light colored carcass	lb.	.04¼
No. 1 peelings	ton	50.00
No. 2 peelings	ton	30.00
No. 3 peelings	ton	24.00
Buffings	ton	18.00
Truck and Bus S.A.G.	ton	20.00
Passenger S.A.G.	ton	18.00
Natural Rubber Red Tubes	lb.	.14
Natural Rubber Black Tubes	lb.	.05
Butyl Rubber Tubes	lb.	.04

Rubber

Natural – Synthetic

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Blackstone 4148

In Los Angeles:
Merit Western Co.
George Steinbach
1248 Wholesale St.
Tucker 8851

STATISTICS *Of Interest to the Rubber Industry*

U. S. Imports and Re-Exports of Natural Rubber

	GROSS IMPORTS										RE-EXPORTS		TOTAL NET IMPORTS
	Natural Rubber (Dry)			Natural Rubber (Latex)			Guayule						
Year	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Total Gross Imports Long Tons	Long Tons	Total Declared Value	Long Tons
1936	467,064	152,072,496	14.54	19,852	6,659,899	14.98	1,229	286,552	10.41	488,145	12,581	4,488,223	475,564
1937	574,600	237,307,041	18.44	23,185	10,213,670	19.67	2,691	745,873	12.37	600,476	7,948	3,386,408	592,528
1938	397,640	125,373,864	14.08	11,944	4,168,127	15.58	2,508	628,886	11.19	412,092	5,652	1,799,124	406,440
1939	469,946	167,586,780	15.92	27,437*	10,467,552	17.03	2,233	463,345	9.27	499,616	13,125	5,832,618	486,491
1940	781,202	303,308,823	17.33	33,789	14,593,466	19.28	3,633*	798,007	9.31	818,624	7,060	3,197,136	811,564
1941	989,198	401,976,317	18.14	34,797*	15,965,627	20.48	4,881	1,145,767	10.48	1,029,176	5,376	2,757,872	1,023,800
1942	266,276	112,537,426	18.87	10,646	5,630,667	23.61	5,523	1,660,792	13.42	282,445	10,856	5,913,386	271,589
1943	50,358	31,369,198	27.81	1,890	1,312,202	31.00	7,678*	3,636,789	21.14	59,926	22,583	16,446,707	37,343
1944	103,847	73,908,549	31.77	3,091	2,092,211	30.22	6,701*	3,351,233	22.33	113,639	9,739	8,712,695	103,900
1945	134,408	95,814,102	31.82	4,773	3,115,853	29.14	10,040	5,963,797	26.52	149,221	9,509	7,201,746	139,712
1946	376,502	228,796,110	27.13	8,421	5,843,085	30.98	5,344	2,859,246	23.89	390,267	7,711	5,331,954	382,556
1947	691,087	306,951,814	19.83	17,542	9,787,722	24.91	2,884	1,492,825	23.11	711,513	4,121	2,354,494	707,392
1948	702,293	290,849,177	18.49	32,745	18,288,223	24.93	302	71,330	10.53	735,340	6,672	3,259,324	728,668
1949	630,808	225,343,624	15.95	29,743	14,968,650	22.47	....	.....	....	660,551	6,253	2,746,109	654,298
1950	747,109	416,222,598	24.87	54,401	41,764,486	34.27	739	254,331	15.37	802,249	8,640	6,832,821	793,609
1951	677,874	727,343,348	47.90	54,963	80,178,309	65.12	1,619	1,258,941	34.71	734,456	2,603	3,947,740	731,853
1951:													
Sept.	59,309	57,619,906	43.44	1,800	1,838,512	45.59	121	78,427	29.00	61,230	89	45,061	61,141
Oct.	51,850	49,109,610	42.28	3,055	3,499,763	51.15	206	149,590	32.42	55,111	73	120,779	55,038
Nov.	54,561	51,161,914	41.79	2,620	3,251,833	55.42	107	75,370	32.19	57,278	67	96,521	57,211
Dec.	44,332	42,695,894	42.99	860	1,190,609	61.82	171	110,448	28.79	45,363	25	22,732	45,338
1952:													
Jan.	80,561	76,995,564	42.67	2,569	3,299,142	39.95	153	97,922	28.60	83,283	140	207,976	83,143
Feb.	73,781	70,775,631	42.82	2,556	3,016,023	52.66	45	29,061	28.58	76,382	95	120,410	76,287
Mar.	81,577	76,567,896	41.90	3,570	4,149,537	51.88	25	12,701	22.68	85,172	93	127,007	85,079
Apr.	78,098	71,497,007	40.87	4,821	4,402,416	40.77	55	27,927	22.67	82,974	85	103,819	82,889
May	55,764	45,898,163	36.74	3,409	3,140,619	41.12	15	7,644	22.62	59,188	130	150,568	59,058
June	62,744	48,168,471	34.27	4,445	3,934,931	30.62	74	28,985	16.85	67,263	1,555	190,975	65,708
July	45,718	30,026,066	29.32	2,295	2,378,572	33.74	412	153,855	16.66	48,425	135	128,437	48,290
Aug.	62,455	37,485,360	26.79	4,684	3,513,319	33.49	....	.....	....	67,139	373	278,927	66,766
Sept.	47,696	28,223,624	26.42	3,813	2,771,909	32.45	....	.....	....	51,509	279	202,978	51,230
Oct.	50,762	29,340,768	25.84	4,890	3,272,571	29.88	....	.....	....	55,652	337	248,642	55,315

Source: Bureau of the Census, U. S. Department of Commerce. * Adjusted to agree with total gross imports.

Notes: (1) Figures for latex are on a dry weight basis. (2) Figures for re-exports include natural rubber (dry and latex) and guayule. (3) In the years 1940 through 1943, crepe sole rubber imports were reported under a separate classification. Such imports, which are included under natural rubber, dry above, were: 856,294 pounds, valued at $191,097 in 1940; 379,607 pounds, valued at $85,924 in 1941; 662,503 pounds, valued at $159,530 in 1942; and 21,653 pounds, valued at $5,215 in 1943.

Natural Rubber
(Including Latex and Guayule)

(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1936	488,145	575,000	12,581	223,000
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,007	775,000	5,376	533,344
1942	282,653	376,791	10,856	422,714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1947	688,354	562,661	4,101	129,038
1948	735,227	627,332	6,673	141,541
1949	660,792	574,522	6,253	106,619
1950	802,249	720,268	8,644	89,215
1951	733,048	454,015	2,603	76,569
1951:				
Sept.	61,409	36,887	27	56,941
Oct.	55,219	37,407	73	63,501
Nov.	57,108	35,037	67	63,689
Dec.	45,193	33,256	25	76,569
1952:				
Jan.	83,283	36,989	140	75,488
Feb.	76,383	34,841	95	73,959
Mar.	85,172	35,682	93	61,553
Apr.	82,974	36,417	85	59,422
May	59,188	36,437	130	63,988
June	67,246	36,946	156	72,995
July	49,251	32,760	136	84,839
Aug.	67,139	32,941	373	86,657
Sept.	52,785	45,110	279	84,150
Oct.	54,589	45,110	337	82,861
Nov.	49,346	41,749	585	86,243

Source: Rubber Division, NPA, U. S. Department of Commerce.

U.S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

(All Quantities in Long Tons)

	Balata		Jelutong		Gutta-Percha & Other Guttas	
Year	Tons	Value	Tons	Value	Tons	Value
1936	535	199,368	6,163	1,296,364	1,568	555,643
1937	354	151,344	7,109	2,017,786	1,122	440,894
1938	509	181,140	9,132	2,944,504	444	204,582
1939	694	265,553	6,640	1,603,418	1,740	539,255
1940	648	300,500	7,451	2,449,137	2,340	1,004,885
1941	924	489,514	8,821	2,954,001	1,783	607,025
1942	1,544	1,107,059	1,200	530,296	804	525,763
1943	1,047	708,701	35	14,840	....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,496,887	392	779,591
1948	1,195	805,078	3,401	2,377,765	423	542,788
1949	1,391	814,554	1,043	834,978	197	189,021
1950	2,117	1,589,885	1,789	1,515,162	541	745,418
1951	2,452	1,973,271	1,669	2,608,359	383	430,539
1951:						
Aug.	121	136,723	142	224,194	8	7,060
Sept.	307	227,392	62	105,395	12	14,660
Oct.	368	383,056	138	241,246	5	6,175
Nov.	148	123,442	167	270,242	33	26,011
Dec.	96	113,773	52	99,761	8	23,467
1952:						
Jan.	126	95,203	204	375,802	27	59,439
Feb.	31	23,118	15	211,229	10	33,474
Mar.	50	43,207	128	217,096	27	43,861
Apr.	49	31,239	234	409,076	32	41,391
May	57	32,488	92	141,257	26	27,853
June	57	31,787	212	273,357	50	50,941
July	55	35,941	100	148,350	16	18,422
Aug.	16	9,037	142	193,364	28	31,011
Sept.	109	51,414	148	183,692	15	12,291
Oct.	130	125,137	95	99,181	20	17,937

Source: U. S. Department of Commerce.

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RUBBER-FLO's **effectiveness has been proved time and time again in plants where maintenance costs were abnormally high and production unsteady. The results were amazing! *After a full year's operation,* the molds were still clean, and there was not as much as a single case of shut down due to dirty or sticky molds. What's more, Rubber-Flo is easy to use — just mix with water and spray, or brush on molds or uncured stock — it's non-toxic and odorless.**

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DISSOLVA-SOL: A highly effective metal cleaner used extensively by manufacturers of reclaimed rubber and allied products.

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Natural and Synthetic

Latex and Latex Compounds

for all purposes

Synthetic Rubber—Totals

(GR-S, Neoprene, Butyl, and Buna N Types)

(All Quantities in Long Tons)

Year	Production	Imports	Consumption	Exports	Stocks On Hand at End of Period
1941	8,383	.....	6,259	572	1,702
1942	22,434	.....	17,651	1,419	4,612
1943	231,722	.....	170,891	18,148	41,568
1944	762,630	11,043	566,670	104,266	142,927
1945	820,373	10,407	693,580	83,778	203,454
1946	740,026	7,709	761,699	72,920	114,963
1947	508,702	1,093	559,566	11,385	62,366
1948	488,343	15,671	442,072	4,874	115,111
1949	393,690	17,242	414,381	6,483	98,042
1950	476,184	25,722	538,289	7,652	52,758
1951	845,155	10,085	758,897	9,249	129,420
1952:					
Aug.	59,214	1,612	61,214	1,921	150,254
Sept.	58,352	2,108	66,668	1,573	141,837
Oct.	62,553	2,101	73,963	1,525	133,042
Nov.	60,540	2,059	66,240	1,148	123,745
Dec.	65,740	2,100	71,098	....	119,616

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures shown include the output of both government and privately-owned plants. (3) Figures for 1941 are estimated.

Synthetic Rubber—By Type

(All Quantities in Long Tons)

New Supply

	GR-S (Buna S)	GR-M (Neoprene)	GR-I (Butyl)	Buna N Types	Total
1944	679,949	56,660	20,252	16,812	773,673
1945	724,859	45,672	52,378	7,871	830,780
1946	613,408	47,766	80,823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795
1948	405,492	34,848	56,662	7,012	504,014
1949	310,599	35,215	54,046	11,072	410,932
1950	378,887	50,067	60,915	12,037	501,906
1951	704,525	58,907	76,475	15,333	855,240

Consumption

1944	495,552	46,243	10,763	14,112	566,670
1945	600,145	42,394	43,012	8,029	693,580
1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	68,838	4,536	559,666
1948	345,313	32,118	58,870	5,771	442,072
1949	299,420	31,753	50,855	8,827	414,381
1950	416,230	43,781	66,348	11,930	538,289
1951	626,444	48,887	70,500	13,066	758,897

Exports

1944	98,380	4,799	530	557	104,266
1945	76,555	5,837	980	406	83,778
1946	68,763	2,642	495	797	72,697
1947	7,951	2,617	62	755	11,385
1948	1,093	2,875	21	885	4,874
1949	1,401	3,330	178	1,574	6,483
1950	900	4,826	31	1,895	7,652
1951	483	6,825	216	1,725	9,249

Stocks at End of Period

1944	116,130	11,739	9,892	5,166	142,927
1945	170,571	9,703	18,378	4,802	203,454
1946	81,483	10,470	19,478	3,755	115,186
1947	40,606	5,237	13,184	3,339	62,366
1948	96,282	5,072	10,995	2,762	115,111
1949	77,731	4,654	12,224	3,433	98,042
1950	36,942	5,733	7,243	2,840	52,758
1951	105,271	8,379	12,481	3,289	129,420

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures for GR-M and Buna N Types include production of privately-owned plants.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1945	1946	1947	1948	1949	1950	1951	1952
Jan.	52,008	51,746	57,057	61,308	63,125	66,981	80,670	86,863
Feb.	48,856	47,654	50,551	56,487	57,980	53,274	72,864	82,043
Mar.	55,364	56,703	59,947	68,171	73,282	78,780	86,962	87,065
Apr.	59,024	62,111	64,140	72,183	75,318	80,350	87,573	98,653
May	60,748	66,800	70,865	77,186	81,665	89,035	100,266	101,137
June	60,580	63,247	71,329	78,044	83,374	90,174	96,364	99,305
July	66,170	60,076	73,441	81,428	83,129	91,677	100,567	105,307
Aug.	70,058	66,729	72,089	80,351	84,707	94,507	101,453	102,954
Sept.	64,529	62,268	71,384	76,159	80,832	86,725	91,891	100,095
Oct.	55,708	66,637	73,277	75,164	79,327	89,067	100,209	103,689
Nov.	53,543	61,345	64,158	72,560	76,346	82,688	88,581	91,326
Dec.	49,745	61,101	67,506	72,162	75,628	81,032	84,551	95,817
Total	696,333	735,417	795,015	871,270	913,713	994,290	1,091,951	1,154,254

Source: U. S. Bureau of Mines.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	Production	Consumption—Tons	Consumption—% to Crude [a]	Exports	Stocks On Hand at End of Period
1936	150,571	141,486	24.6	7,085	19,000
1937	185,033	162,000	29.8	13,233	28,800
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007 [b]	254,820	64.6	30,405	42,532
1943	304,058 [c]	291,082	59.6	15,678	46,201
1944	260,631 [d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1948	266,861	261,113	24.4	11,428	32,630
1949	224,029	226,679	22.5	10,637	28,263
1950	314,008	303,733	24.1	11,740	35,708
1951	366,700	346,121	28.5	14,722	45,082
1952:					
May	23,267	22,314	21.7	1,078	40,169
June	21,179	21,850	21.2	903	38,973
July	16,338	18,354	20.1	735	36,287
Aug.	17,191	20,548	21.8	813	32,224
Sept.	22,009	23,131	21.8	860	31,430
Oct.	27,612	26,830	22.5	806	31,463
Nov.	23,068	22,896	21.2	1,050	30,176
Dec.	25,859	24,025	20.8	928	30,063

Source: U. S. Department of Commerce.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. [a] Includes natural and synthetic rubber. [b] Includes 893 tons of imports. [c] Includes 67 tons of imports. [d] Includes 21 tons of imports.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1933	1,573,512	346,545	1,920,057	1943	0	4,501	4,501
1934	2,177,919	575,192	2,753,111	1944	0	124,819	124,819
1935	3,252,244	694,690	3,946,934	1945	83,792	313,643	397,435
1936	3,669,528	781,862	4,451,390	1946	2,148,699	930,760	3,079,459
1937	3,915,889	892,382	4,808,271	1947	3,558,178	1,220,634	4,778,812
1938	2,000,985	485,852	2,486,837	1948	3,909,270	1,363,856	5,273,126
1939	2,866,796	704,308	3,571,104	1949	5,108,841	1,123,736	6,232,577
1940	3,692,328	721,637	4,413,965	1950	6,665,836	1,332,263	7,998,099
1941	3,744,500	875,381	4,619,681	1951	5,337,729	1,420,432	6,758,161
1942	220,814	133,083	353,897	1952	4,320,788	1,212,390	5,533,178
1951:							
Jan.	478,589	127,583	606,172	July	381,407	110,244	481,651
Feb.	505,865	111,935	617,800	Aug.	426,932	121,993	548,925
Mar.	617,399	136,794	754,193	Sept.	365,906	109,353	475,259
Apr.	503,038	135,415	638,453	Oct.	414,533	110,740	525,273
May	511,938	140,047	651,985	Nov.	356,788	93,179	449,967
June	482,029	134,818	616,847	Dec.	293,305	17,481	310,786
1952:							
Jan.	273,639	100,993	374,632	July	168,327	43,231	211,558
Feb.	334,058	100,533	434,591	Aug.	218,577	52,056	270,633
Mar.	373,237	109,167	482,404	Sept.	438,397	112,375	550,772
Apr.	416,155	112,833	528,988	Oct.	471,808	132,064	603,872
May	398,286	105,208	503,494	Nov.	405,111	114,106	519,217
June	408,700	109,526	518,226	Dec.	418,977	115,814	534,791

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Rim Production

	1948	1949	1950	1951	1952
Passenger Car	23,842,796	27,715,344	35,096,404	29,145,367	24,936,844
Truck & Bus	6,920,231	4,238,174	6,625,129	6,877,419	5,752,674
Agricultural	3,140,882	2,695,430	2,853,483	3,019,581	2,073,116
Earth Mover	13,330	9,895	15,602	28,026	31,791
Total	33,917,239	34,658,843	44,590,618	39,070,393	32,794,425

	1952—Aug.	Sept.	Oct.	Nov.	Dec.	1953—Jan.
Passenger Car	1,589,252	2,964,901	2,537,018	2,352,973	2,561,628	2,646,978
Truck & Bus	395,190	514,833	558,605	446,943	595,829	582,137
Agricultural	147,512	182,075	157,931	109,250	141,251	259,023
Earth Mover	712	538	2,396	3,594	2,687	2,095
Total	2,132,666	3,662,347	3,255,950	2,913,060	3,301,395	3,490,233

Source: The Tire & Rim Association, Inc.

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Automotive Pneumatic Casings

(Thousands of Units)

	Shipments: Original Equipment	Shipments: Replacement	Shipments: Export	Shipments: Total	Production	Inventory End of Period
1940 (total)	22,252	35,346	1,176	58,774	59,186	9,127
Passenger Car.	19,560	30,903	411	50,874	50,965	7,270
Truck and Bus	2,692	4,443	765	7,900	8,221	1,857
1941 (total)	24,780	39,895	1,489	66,164	61,540	4,436
Passenger Car.	19,855	34,119	586	54,560	50,392	3,165
Truck and Bus	4,925	5,776	903	11,604	11,148	1,271
1942 (total)	6,680	8,872	207	15,759	15,351	6,247
Passenger Car.	910	2,734	38	3,682	2,790	4,432
Truck and Bus	5,770	6,138	169	12,077	12,561	1,815
1943 (total)	6,128	18,547	225	24,900	20,423	1,883
Passenger Car.	82	10,606	71	10,759	7,620	1,132
Truck and Bus	6,046	7,941	154	14,141	12,803	751
1944 (total)	6,654	26,439	263	33,356	33,446	2,013
Passenger Car.	208	18,330	130	18,668	18,819	1,218
Truck and Bus	6,446	8,109	133	14,688	14,627	795
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car.	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11,016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car.	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947 (total)	25,056	62,871	3,256	91,183	95,550	6,949
Passenger Car.	19,644	52,857	1,608	74,109	77,795	5,444
Truck and Bus	5,412	10,014	1,648	17,074	17,755	1,505
1948 (total)	26,845	49,148	1,787	77,781	81,314	10,698
Passenger Car.	21,589	41,295	656	63,540	66,738	8,773
Truck and Bus	5,256	7,853	1,132	14,241	14,576	1,925
1949 (total)	**31,584**	**43,466**	**1,467**	**76,517**	**76,369**	**10,638**
Passenger Car.	**28,129**	**36,440**	**509**	**65,077**	**65,140**	**8,904**
Truck and Bus	**3,456**	**7,026**	**958**	**11,440**	**11,228**	**1,734**
1950 (total)	41,349	56,808	1,430	99,587	92,754	3,794
Passenger Car.	36,678	47,103	642	84,423	78,598	3,050
Truck and Bus	4,671	9,705	788	15,164	14,156	743
1951 (total)	32,153	44,612	1,677	78,442	83,405	8,765
Passenger Car.	26,729	34,226	723	61,678	65,546	6,973
Truck and Bus	5,424	10,386	954	16,764	17,859	1,791
1952 (total)	29,484	54,402	1,521	85,407	90,522	14,093
Passenger Car.	24,102	45,525	742	70,369	74,441	11,245
Truck and Bus	5,381	8,877	779	15,038	16,081	2,849
1952:						
Oct. (total)	3,200	4,532	114	7,846	8,663	10,821
Passenger Car.	2,635	3,584	59	6,277	7,185	8,244
Truck and Bus	565	948	55	1,569	1,478	2,578
Nov. (total)	2,665	3,140	86	5,892	7,384	12,272
Passenger Car.	2,188	2,433	42	4,663	6,071	9,612
Truck and Bus	478	708	44	1,229	1,313	2,659
Dec. (total)	2,916	3,173	137	6,226	7,945	14,093
Passenger Car.	2,446	2,447	83	4,976	6,520	11,245
Truck and Bus	470	725	55	1,250	1,425	2,849

Source: The Rubber Manufacturers Association, Inc.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton: Tire Cord Not Woven	Cotton: Cord Fabric Woven	Cotton: Chafer and All Other Tire Fabrics	Cotton: Total	Rayon and Nylon[b]: Tire Cord Not Woven	Rayon and Nylon[b]: Tire Cord And Other Tire Fabrics	Rayon and Nylon[b]: Total
1948:							
Jan.-Mar.	18,546	50,251	19,391	88,188	a	60,569	60,569
Apr.-June	15,585	45,385	18,213	79,183	a	59,759	59,759
July-Sept.	29,743	45,927	c	75,670	a	63,642	63,642
Oct.-Dec.	13,321	34,424	15,879	63,624	a	65,258	65,258
Total	77,195	175,987	53,483	306,665	.....	249,228	249,228
1949:							
Jan.-Mar.	d	33,213	25,395	56,608	a	68,296	68,926
Apr.-June	5,309	29,114	13,617	48,040	a	68,269	68,269
July-Sept.	1,343	16,620	11,141	29,104	15,640	55,969	71,609
Oct.-Dec.	180	17,650	11,886	29,716	12,967	58,890	72,857
Total	6,832	96,597	62,039	163,468	28,607	251,424	281,661
1950:							
Jan.-Mar.	3,939	19,210	12,948	36,097	12,469	60,981	73,450
Apr.-June	11,077	29,498	14,071	54,646	11,510	59,966	71,476
July-Sept.	10,529	39,792	15,101	65,152	13,161	61,614	74,775
Oct.-Dec.	13,314	37,759	14,405	65,578	12,942	63,399	76,341
Total	38,859	126,259	56,525	221,473	50,082	245,960	296,476
1951:							
Jan.-Mar.	11,497	38,269	16,737	66,503	11,878	65,512	77,390
Apr.-June	12,608	42,491	17,055	72,154	11,979	61,957	73,936
July-Sept.	16,744	44,340	17,433	78,517	12,091	67,982	80,073
Oct.-Dec.	14,237	43,820	13,899	71,956	a	83,354	83,354
Total	55,116	168,920	65,124	289,160	35,948	278,805	314,753

Source: U. S. Bureau of the Census.

Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord not woven. (d) Included with chafer and all other tire fabrics.

Automotive Inner Tubes

(Thousands of Units)

	Shipments: Original Equipment	Shipments: Replacement	Shipments: Export	Shipments: Total	Production	Inventory End of Period
1941	24,722	33,749	1,232	59,703	57,433	4,686
1942	6,895	7,213	159	14,267	12,685	6,206
1943	6,350	12,474	189	19,014	15,014	2,626
1944	6,460	20,569	196	27,224	27,488	2,813
1945	5,988	33,906	411	40,304	41,742	3,627
1946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,046	46,560	2,483	74,088	79,181	8,059
1948	26,833	40,548	1,119	68,499	70,033	9,641
1949	31,521	31,450	887	63,858	65,114	10,657
1950	41,240	42,671	811	84,723	80,179	....
1951	32,151	32,284	1,071	65,507	67,249	10,094
1952	29,471	32,931	1,015	63,418	65,039	11,744
1952:						
Sept.	2,820	3,067	98	5,984	5,397	10,086
Oct.	3,198	2,602	59	5,859	6,220	10,386
Nov.	2,667	1,898	52	4,617	5,117	10,910
Dec.	2,910	1,901	57	4,869	5,644	11,744

Source: The Rubber Manufacturers Association, Inc.

Smoked Sheets—Spot Closing Prices

(New York Market—Cents per Pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1911	184	114	141.30	1932	4¾	2½	3.49
1912	140	108	121.60	1933	9⅞	2⅝	5.96
1913	113	59	82.04	1934	15⅞	8¾	12.92
1914	93	56	65.33	1935	13¾	10½	12.37
1915	79	58½	65.85	1936	23	13½	16.41
1916	102	55	72.50	1937	26½	14	19.39
1917	90	52	72.23	1938	17⅛	10¼	14.64
1918	70	40	60.15	1939	24	14⅛	17.57
1919	57	38½	48.70	1940	24	18¼	20.10
1920	56½	16	36.30	1941	24⅞	19½	22.40
1921	21¾	11½	16.36	1942	22½	22½	22.50
1922	28¾	13¾	17.50	1943	22½	22½	22.50
1923	37½	24¾	29.45	1944	22½	22½	22.50
1924	40⅞	17¾	26.20	1945	22½	22½	22.50
1925	121	34⅜	72.46	1946	22½	22½	22.50
1926	88½	36¾	48.50	1947	25	14	20.00
1927	41¾	33	37.72	1948	25	18	21.99
1928	41¾	17	22.48	1949	19¾	15¾	17.57
1929	26¾	15½	20.55	1950	86	18	41.10
1930	16½	7½	11.98	1951	76	52	(a)
1931	8¾	4¼	6.17	1952*	33	26½	29.13

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947. (a) Free trading suspended March 31, 1951. GSA selling price ranged between 52 and 66c during balance of year. * Free trading was resumed on July 1, 1952; figures represent only July through December, 1952.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1946	1947	1948	1949	1950	1951	1952	1953
Jan.	25.49	32.58	36.09	33.37	31.89	45.04	42.96	33.24
Feb.	26.57	33.91	33.63	33.41	32.79	(a)	41.64	33.76
Mar.	27.52	35.89	35.04	33.44	32.65	46.06	41.70	....
Apr.	28.40	35.89	38.10	33.84	33.23	46.06	41.79	....
May	28.17	36.51	38.57	33.73	33.64	46.06	39.68	....
June	29.89	37.83	38.12	33.56	34.61	46.06	41.31	....
July	34.11	38.03	34.89	32.99	38.11	41.21	40.37	....
Aug.	36.31	34.83	32.23	32.06	38.93	35.93	40.42	....
Sept.	37.59	32.21	31.92	30.94	41.62	36.20	39.75	....
Oct.	36.79	32.39	32.01	30.32	40.66	38.13	37.52	....
Nov.	31.50	34.50	32.15	30.52	43.11	42.70	35.59	....
Dec.	33.03	36.74	32.90	31.08	43.37	43.32	33.76	....
Average for Year	31.28	35.11	34.64	32.44	37.05	42.43	39.71	....

Note: The Government established a ceiling price of 45.76c for spot cotton on March 3, 1951. (a) Trading suspended during February.

Consumption of Vinyl Resins

(In Thousands of Pounds)

	Sheeting and Film [a]	Textile and Paper Coating Resins	Molding and Extrusion Materials	All Other
1949	157,544	29,470	81,842	19,792
1950	227,149	46,044	113,889	21,868
1951	161,547	43,688	134,890	23,934
1952	154,902	42,298	140,872	31,793
1952:				
Sept.	13,939	3,714	12,663	3,267
Oct.	16,271	4,310	13,973	3,343
Nov.	13,666	3,932	13,956	3,119
Dec.	12,874	3,483	14,764	3,366

Source: U. S. Tariff Commission.

Note: (a) Includes weight of fillers, plasticizers, extenders and safety glass sheeting. Beginning January, 1951, statistics are listed on a resin content basis.

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for

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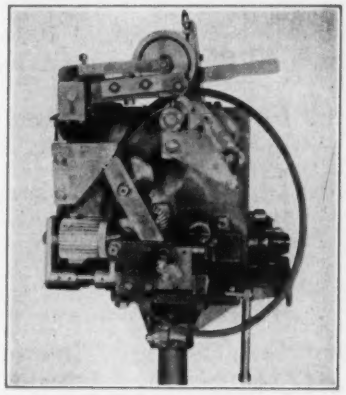

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Rubber Industry Employment, Wages and Hours

All Rubber Products

	1951				1952			
Mo.	Production Workers (thousands)	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings	Production Workers (thousands)	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
Jan.	222	$66.78	40.4	$1.653	218	$74.19	40.9	$1.814
Feb.	222	63.37	38.9	1.629	215	73.31	40.5	1.810
Mar.	220	65.88	40.0	1.647	215	72.58	40.3	1.801
Apr.	219	65.96	40.0	1.649	213	71.40	39.6	1.803
May	220	68.56	41.3	1.660	213	73.47	40.5	1.814
June	220	71.27	41.9	1.701	215	75.01	40.9	1.834
July	217	70.81	41.0	1.727	202	72.15	39.6	1.822
Aug.	218	69.52	40.7	1.708	212	73.65	40.6	1.814
Sept.	218	70.18	40.9	1.716	216	74.32	40.7	1.826
Oct.	215	68.67	40.3	1.704	220	74.34	40.8	1.822
Nov.	219	69.46	40.5	1.715	223	....	....	....
Dec.	219	73.91	41.2	1.794	....	....	....	....

Tires and Tubes

Jan.	91.3	73.69	38.4	1.919	94.4	86.99	40.9	2.127
Feb.	90.6	66.95	35.5	1.886	94.2	85.75	40.6	2.112
Mar.	88.3	71.40	37.6	1.899	93.9	83.46	39.8	2.097
Apr.	87.4	70.15	37.0	1.896	94.6	81.90	39.3	2.084
May	88.3	75.92	39.4	1.927	94.6	84.96	40.4	2.103
June	89.9	82.44	41.7	1.977	95.3	87.79	41.1	2.136
July	90.0	83.67	41.4	2.021	93.4	84.22	39.8	2.116
Aug.	91.5	82.07	41.2	1.992	92.3	85.29	40.5	2.106
Sept.	92.4	81.64	40.9	1.996	93.4	84.39	39.9	2.115
Oct.	89.8	78.76	39.9	1.974	93.5	83.38	39.5	2.111
Nov.	94.8	80.27	40.5	1.982	....	....	....	....
Dec.	95.4	86.26	41.0	2.104	....	....	....	....

Rubber Footwear

Jan.	24.9	57.53	41.6	1.383	25.4	60.27	40.1	1.503
Feb.	25.3	55.87	40.6	1.376	24.7	60.46	39.8	1.519
Mar.	25.0	58.17	41.4	1.405	24.2	61.51	40.2	1.530
Apr.	24.8	59.82	42.1	1.421	22.0	59.42	39.3	1.512
May	25.4	61.48	42.9	1.433	23.5	60.69	39.9	1.521
June	25.7	59.98	42.3	1.418	23.7	61.38	40.3	1.523
July	24.8	54.68	39.0	1.402	19.0	58.83	39.3	1.497
Aug.	25.2	57.04	40.8	1.398	24.0	61.93	40.4	1.533
Sept.	25.3	55.94	40.1	1.395	24.6	62.67	40.8	1.536
Oct.	25.5	56.76	40.0	1.404	25.5	63.50	41.1	1.545
Nov.	25.6	56.64	40.2	1.409	....	....	....	....
Dec.	25.5	59.95	40.7	1.473	....	....	....	....

All Other Rubber Products

Jan.	105.8	63.06	41.9	1.505	97.9	65.63	41.2	1.593
Feb.	106.3	61.95	41.3	1.500	96.3	64.43	40.6	1.587
Mar.	106.3	63.13	41.7	1.514	97.2	64.83	40.8	1.589
Apr.	106.3	63.81	41.9	1.523	96.3	63.68	39.9	1.596
May	106.0	64.09	42.5	1.508	95.0	65.32	40.8	1.601
June	104.7	64.47	42.0	1.535	95.7	65.73	40.9	1.607
July	102.2	63.29	41.1	1.540	89.8	62.29	39.4	1.581
Aug.	101.2	61.42	40.3	1.524	95.5	65.44	40.8	1.604
Sept.	100.2	63.06	41.0	1.538	98.0	67.81	41.5	1.634
Oct.	99.4	62.68	40.7	1.540	101.0	68.84	42.0	1.639
Nov.	98.2	62.36	40.6	1.536	....	....	....	....
Dec.	97.9	65.45	41.5	1.577	....	....	....	....

Source: U. S. Department of Commerce and Labor.

Note: Data are based upon reports from cooperating establishments covering both full and part-time employees who worked during or received pay for the pay period ending nearest the 15th of the month. The employment series have been adjusted to levels indicated by Federal Security Agency data for 1947, and have been carried forward from 1947 bench-mark levels, thereby providing consistent series. Hours and earning data pertain only to production and related workers.

Production Index for the Rubber Industry

Production 1935-1939 = 100

(Based on man-hours)

	1950	1951	1952		1950	1951	1952
Jan.	194	244	248	July	222	243	225
Feb.	195	235	243	Aug.	236	243	242
Mar.	197	239	242	Sept.	244	245	252
Apr.	203	238	235	Oct.	250	239	258
May	213	247	242	Nov.	250	245	263
June	221	251	246	Dec.	251	250	273

Source: U. S. Department of Commerce.

Sales by the Rubber Industry

(In Millions of Dollars)

	1950	1951	1952		1950	1951	1952
Jan.	265	454	468	July	454	438	408
Feb.	273	434	442	Aug.	457	467	452
Mar.	293	459	406	Sept.	404	435	482
Apr.	288	439	437	Oct.	405	445	464
May	321	432	424	Nov.	397	438	438
June	350	433	430	Dec.	424	363	....

Source: U. S. Department of Commerce.

Rubber Manufacturers' Inventories

(Based upon Book-Value)

(In Millions of Dollars)

	1950	1951	1952		1950	1951	1952
Jan.	524	562	840	July	501	616	884
Feb.	526	555	848	Aug.	483	640	884
Mar.	532	554	865	Sept.	502	659	877
Apr.	536	565	877	Oct.	524	705	874
May	540	583	878	Nov.	564	739	879
June	544	610	864	Dec.	549	799	....

Source: U. S. Department of Commerce.

Various Compounding Materials Consumed by the Rubber Industry

Material	1945	1946	1947	1948	1949	1950	1951
Antimony, Primary:							
Short tons	.....	.....	39	41	55	103 [c]	19 [c]
% of total	.....	.....	.002	.003	.005	.007	.001
Asphalt: [a]							
Short tons	19,483	28,715	32,113	19,967	18,050	26,819	21,414
% of total	.005	.007	.007	.004	.003	.003	.003
Barite (Barytes):							
Short tons	10,000	20,000	17,000	18,000	14,000	19,000	15,000
% of total	2.1	4.4	3.1	2.85	2.53	3.31	2.13
Carbon Black:							
Short tons	402,193	470,732	471,790	435,282	383,565	515,184	530,614
% of total	95.5	95.3	94.3	95.5	93.3	92.9	92.9
Clay, Kaolin:							
Short tons	109,936	162,393	166,201	176,965	197,341	263,306	231,331
% of total	11.7	12.3	11.5	11.3	13.1	15.0	12.7
Clay, Fire & Stoneware:							
Short tons	7,800	12,951	17,970	15,480	27,148	9,500	.....
% of total	0.1	0.2	0.2	0.2	0.3	0.1	.....
Lime:							
Short tons	7,170	3,193	589	1,154	715	908	.....
% of total	0.12	0.05	0.01	0.02	.0002	.0002	.....
Litharge:							
Short tons	1,864	2,131	2,205	2,835	1,398	3,047	2,641
% of total	1.3	1.6	1.3	1.8	1.2	1.7	1.7
Lithopone:							
Short tons	977	1,607	3,085	4,192	3,245	4,092	3,295
% of total	0.7	1.1	1.9	3.0	4.1	3.9	3.2
Mica, Ground:							
Short tons	3,715	4,951	3,900	4,372	3,856	5,776	6,551
% of total	7.1	8.0	6.0	7.0	7.0	8.0	9.0
Sulfur:							
Short tons	64,960	72,800	72,800	70,560	59,360	75,000	.....
% of total	2.0	2.2	1.8	1.7	1.5	1.3	.....
Talc: [b]							
Short tons	63,758*	65,980	71,840	66,226	53,400	75,900	70,970
% of total	16.0	14.4	13.9	13.0	12.0	12.0	11.2
Zinc Oxide:							
Short tons	63,447	83,776	82,248	82,895	58,496	82,944	71,507
% of total	49.6	53.1	51.2	54.9	52.5	51.6	48.5

Source: U. S. Bureau of Mines.

Notes: [a] Solid and semi-solid products of less than 200 penetration. [b] Includes prophyllite and ground soapstone. [c] Does not include precipitated antimony sulfide as in previous years. * Revised.

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PLANT SUPERINTENDENT, 10 years experience in managing mechanical rubber, plastic shoe soling, rubber garden hose production braiding and extrusion. Wishes new opportunity. Can handle people. Address Box 605-P, RUBBER AGE.

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Wanted — Superintendent for small adhesive tape factory located in Eastern Massachusetts. Address Box 627-W, Rubber Age.

WANTED: Superintendent for latex compounding plant, with experience to take full responsibility. Write giving full particulars and references. Replies held strictly confidential. Our staff has knowledge of this ad. Address Box 626-W, RUBBER AGE.

HELP WANTED—Continued

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PLASTIC TILE CHEMIST

Large manufacturing plant in New England seeks Chemist experienced in production of Plastic Floor Tile. Write outline showing education and business experience, particularly in above field. Specify salary expected. Address Box 610-W, RUBBER AGE.

WORKING FOREMAN. EXPERIENCED IN MAKING OF RUBBER CEMENT. NEW YORK AREA. Address Box 612-W, RUBBER AGE.

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Highly successful, well diversified 35 year old midwest company needs qualified young chemical engineer or chemist having 8 years or more mechanical rubber goods compounding and processing experience. Exceptional opportunity, key position. Salary commensurate with ability. All inquiries held in strict confidence. Our employees know of this advertisement. Address Box 622-W, RUBBER AGE.

LATEX CHEMIST

Nationally known pjaint company needs a chemist experienced in preparation of various types of latex emulsions to conduct research and development on latices. In first letter please give complete resume of experience, education, salary requirements, availability and enclose small photograph. Address Box 615-W, RUBBER AGE.

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HELP WANTED—Continued

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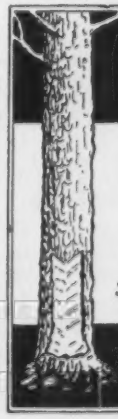

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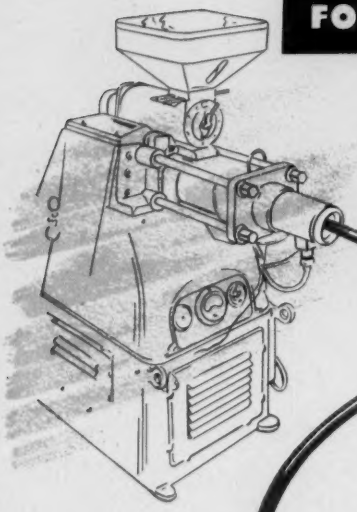

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